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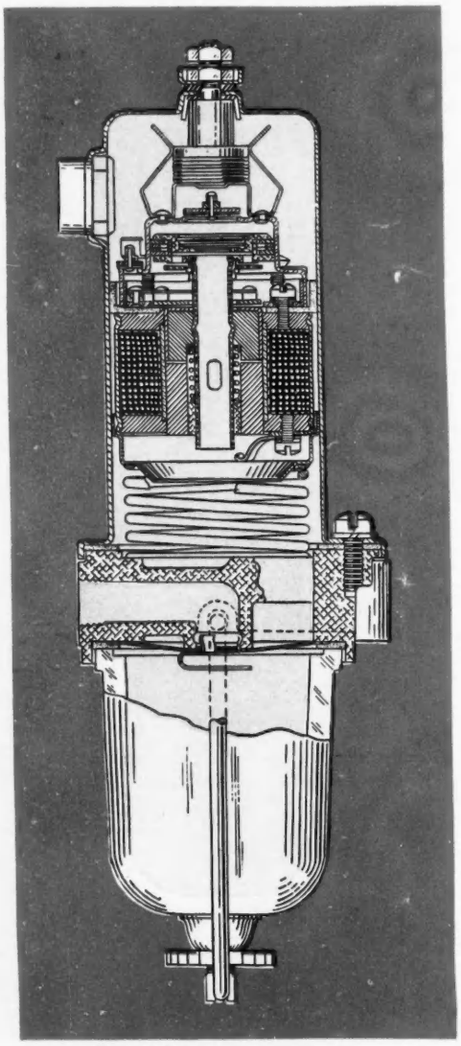

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AUTOMOTIVE INDUSTRIES

Vol. 68, No. 7 • THIRTY-FIFTH YEAR • February 18, 1933

Price Concessions Put

Parts Makers On The Spot

Persistent pressure on suppliers to cut costs forces wage policies which make parts plants vulnerable to labor agitators

by Athel F. Denham,
Field Editor, Automotive Industries

COMING as it did at a critical period for the automotive manufacturing industry when early January sales returns indicate a possibility that the corner has been turned, labor troubles in the Detroit area are proving a major worry to the entire industry. There isn't a major executive in the industry today who will freely discuss labor conditions, wage scales, and employment schedules.

That the strikes which have occurred so far, at the Briggs, Murray, Hayes and Hudson body plants are part of a general plan originally conceived to embrace the whole industry, seems to be clearly indicated. But whether or not communistic organization, in the form of the auto workers' union, are the prime factors behind the strikes, whether or not the walk-outs have been the result of intimidation to a larger extent than dissatisfaction with working conditions, the fact remains that the industry had worked itself into such a position that agitators found a ready sphere for activity.

Abandonment of the Hudson strike Monday morning following a mass meeting of workers Saturday evening at which agitators were voted down, may serve as a preventive against immediate spreading of labor troubles, but unless inherent conditions are corrected, a recurrence of difficulties remains a possibility.

Of the various surface factors, which are claimed to have been paving the way here and there for strikes, might be named the following:

1. Reduction of effective hourly wage scales beyond the reduction of living costs.
2. Reduction in total number of hours worked per week.
3. Non-payment for idle time involved in getting into production on new lines.
4. Importation, occasionally, of cheaper labor from outside of Detroit, notably from the South, in the face of growing unemployment in the Detroit area.

Taking these factors in reverse order, importation of outside cheap labor apparently has not been as widespread as agitators would have Detroit's industrial labor believe, at least in the past year. It has proved a useful tool in promoting dissatisfaction, however, in combination with other factors.

Non-payment for idle time was given as the primary cause for the walk-out at Briggs. Such idle time is inevitable, of course, when production is getting under way on new models, with a lack of perfect synchronization of production, while ironing out manufacturing difficulties. In spite of the fact, however, the Briggs offered to pay for idle time, the strike at its plant was not called off.

Reduction in total number of hours worked per week is only partly due to reduced production schedules during the period of depression. It has been in greater measure due to the desire of industrial executives to provide employment for as many men as possible. The "share-the-work" plan at its inception had the

strong support of labor, and still has in many institutions. In others it has resulted finally in potential labor dissatisfaction, after the primary purpose of the plan had gradually been forgotten. Having been conceived by manufacturers purely as a means of helping labor by reducing unemployment, it has in some cases proven a boomerang. Not only does the plan tend toward decreasing manufacturing efficiency unless carefully controlled, but labor itself has taken the final result, shorter working hours and lower weekly earnings as a topic for criticism of the industrial organization.

General comparisons of effective hourly wage scales, whether or not on a piece rate or group bonus plan, with scales effective two and three years ago are obviously impossible. Even with such comparisons readily available, they would have to be analyzed in the light of present-day purchasing power. The trend in wage scales, of course, has been steadily downward. But even if present hourly scales were equal in commodity purchasing power to those of a few years ago, the more important factor is how much labor receives individually over a period of time, per week or per month.

Business Without Profit

About two or three years ago, it is understood that approximately seven to ten per cent of the total production cost of a new low-priced automobile represented wages paid to direct labor, in other words, roughly $35 per car. It would be highly illuminating to know what the percentage is today. On one hand, we have reduced scales of wages, on the other reduced production increasing the charges for non-labor items. Again, the declining cost of raw materials tends to increase the relative percentage of production cost assigned to labor, while lower prices for the finished vehicle at least partially nullifies the potential gain. Competent authorities estimate direct labor costs today on a low-priced car at not over eight per cent.

Any fundamental discussion of labor conditions finally comes down to the question of prices on finished products, whether complete vehicles, or parts. It has been the conception generally in the industry during past years, that increased volume, or even the maintenance of existing volume could be achieved only through constant reduction in price while maintaining quality.

While reduced materials prices have helped in this respect, and reductions in manufacturing overhead have provided further contributions, the major brunt has been borne by parts suppliers. The latter have been perhaps as much to blame as vehicle manufacturers for this condition, by virtue of their willingness to accept business even if at no profit for the sake of covering their overhead. Vehicle manufacturers, on the other hand, have hammered prices down even beyond this point by competitive buying.

The net result has been that reduction in wage scales at parts plants has exceeded that in vehicle plants by a considerable margin, leaving the parts manufacturer open as the vital point for attack by labor agitators. If this condition continues, if further hammering of parts prices or further reductions in bids for the sake of obtaining or holding business, forces further reductions in wages to labor it is not unforseeable that competent labor agitation might effect a complete paralysis of the industry.

Let us take a simple example. Suppose a manufacturer building 250,000 vehicles per year were buying a part at present for approximately ten cents, using four of these per vehicle. A bid of nine cents per part would effect a saving to the vehicle manufacturer of $10,000 per year—certainly a worthwhile saving apparently. The parts manufacturer, already working on a pure cost basis, with no profit, is faced, however, with the necessity of reducing his production cost by ten per cent. Assuming that he can obtain a maximum of half of this by reduction in general manufacturing costs, and by lower prices for raw materials, he is still faced with the necessity of taking five per cent of the reduction out of labor. Again assuming the general average of a few years ago—of ten per cent of the production cost for labor—to hold true, he is faced with a wage scale reduction in the neighborhood of 50 per cent—unless, of course, more efficient equipment is available which will enable him to effect the necessary saving in labor cost without reducing wage rates.

This is the condition with which the parts industry has been faced for some time. An important factor bringing this condition about is the attitude of vehicle manufacturers regarding overhead charges included in a bid for business. The vehicle manufacturer with his comparatively fixed overhead and excessive plant capacity sometimes has gone so far as to stipulate that the final purchase price of a part must be lower than the actual manufacturing cost would be in his own plant, without addition of fixed plant overhead, to his own cost. "It's there anyway, whether I use it or not," has been his attitude in such cases.

A sounder plan, and one which is finding increasing favor among automotive manufacturers is the charging of plant and equipment only on the "as used" basis. With a plant working at only 30 per cent of capacity, only 30 per cent of plant and equipment charges would be chargeable to production cost, covering the remainder in a write-off in capital structure.

If vehicle manufacturers today were to take over the production of all parts they purchase outside, production costs and retail prices, coincidentally would be raised to a point where volume would be sharply affected. Moreover competitive information, and important engineering assistance from parts suppliers would be completely sacrificed. Yet that is what the industry may be faced with, if present buying tendencies are continued. A recent example was the potential possibility during the first days of the Briggs strike that the Ford Motor Co. might have to take over the production of its own bodies. Complete financial failure of important parts concerns is another possibility that cannot be discounted.

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On the basis of the ten-per-cent-for-labor assumption, a one per cent increase in prices paid for parts would mean a potential 10 per cent increase in wage scales. It would not necessarily mean more than a one per cent increase in car retail prices. On a $500 automobile an increase of $5—on a $1,000 car an increase of $10-$15 in list prices does not seem to be a general obstacle to the maintenance of volume or an increase in volume as economic conditions improve.

Recent history has shown that even $50 on a $500 automobile (the Ford B-4 and V-8 for example) has been no bar to the majority of the public in the purchase of the higher priced car. Today it seems to be more important whether or not an individual can purchase *any automobile,* than whether he can pay $500 and not $510 or $550.

The optimum in cost reduction may have been definitely reached or even passed. Lower prices if necessary in future may have to be predicated on either reduction in quality, on lower cost merchandising methods, new cost-reducing machine tool equipment, a write-down of investments in line with the realities of current price levels, or completely new types of automobiles, inherently cheaper to produce, and probably lighter, possibly also with less performance.

A general slight increase in price at this time or in the near future, on existing types of automobile could even be used by the automotive industry in stimulating sales. A decision in this direction could be capitalized to considerable advantage in the general lay press mediums from which, due to the importance of its advertising volume, the automotive industry can secure excellent editorial cooperation.

And what is more important, the announcement of forthcoming wage scale increases made possible by such a projected move would serve the double purpose of creating confidence and earning the goodwill of labor. It's pretty hard to get a man to strike when he has just received or is about to receive a 10 per cent increase in wages.

Voltage Dividers for Use With Cathode-Ray Oscillograph

RESEARCH Paper No. 460 of the Bureau of Standards deals with the Theory of Voltage Dividers and their Use with Cathode-Ray Oscillographs, the authors being Melville F. Peters, George F. Blackburn, and Paul T. Hannen.

A fundamental requirement for an instrument designed to measure potential difference in an electric circuit is that the measuring instrument shall not introduce more than a negligible change in the character of the circuit under consideration. This sometimes imposes limiting conditions upon the instrument, especially in the case of measuring the voltage across a spark gap with a cathode-ray oscillograph under conditions found in practice.

In automotive ignition systems the capacitance and inductance are low. Measurements made on aircraft engines showed the capacitance of the leads to vary from 40 to 180 $\mu\mu$ f. On radio-shielded engines the capacitance is usually greater than this and has been found to be as high as 400 $\mu\mu$ f. The proximity of the leads to the engine causes the inductance to change with frequency. At high frequencies the iron has very little importance and computations made for the shorter leads, disregarding the effect of iron, showed the inductance to be approximately 1 μ h.

If the voltages are sufficiently low so that they may be applied directly to the deflection plates of the oscillograph, the latter increases the capacitance of the circuit by approximately 20 $\mu\mu$ f. If a short lead is used from the magneto to the spark gap the combined capacitance of the circuit need not exceed 40 $\mu\mu$ f, which enables the experimenter to set up a test circuit which is a sufficiently close approximation to the actual circuit as regards capacitance.

If the voltage is too high to be applied directly to the deflection plates a voltage divider must be used. In a study of magneto discharges it was found that a voltage divider was required, and one was designed which introduced a capacitance of 20 $\mu\mu$f. This voltage divider proved unsatisfactory and the investigation covered in this paper was undertaken to study various possible arrangements and to determine which would be the most suitable for measuring the voltage characteristics of magneto spark discharges.

Equations are developed in the paper which show that if the capacitance of the voltage divider is small, the capacitance to ground cannot be neglected if the deflection of the cathode beam is to be proportional to the applied voltage. Oscillograms of spark discharges obtained with five different circuits confirm the equations.

It was found that resistors had to be placed in the voltage divider to damp out oscillations set up in the divider. Equations are given for resistance voltage dividers expressing the relation between the divided voltage and the applied voltage in terms of the resistance and self-capacitance of the resistors. Methods are given for the determination of the sensitivity of the cathode beam at the photographic plate as well as the determination of the reduction ratio of the voltage divider.

Courtesy Haynes-Stellite Co.

by Joseph Geschelin
Engineering Editor, Automotive Industries

No More Valve

Elimination of this common service job and of other troubles too is aim of valve seat insert developments summarized here.

JUST when a large group of commercial engine builders were wrinkling their brows over the desirability of inserted valve seats—BANG, along comes Chrysler with inserted exhaust valve seats on the whole family including the economically-priced Plymouth. And in the same breath we learn that Willys has followed suit on both the four and six.

Why all the excitement? Apparently it's a case of history repeating itself. Once again an idea born of the hard knocks of service bids fair to find its place as a new engineering principle. We say this advisedly considering that aircraft engines and the few passenger car jobs using aluminum blocks have incorporated inserted valve seats for many years. But their problem is entirely different. Such engines couldn't operate without hard inserts, while engines with cast iron blocks can.

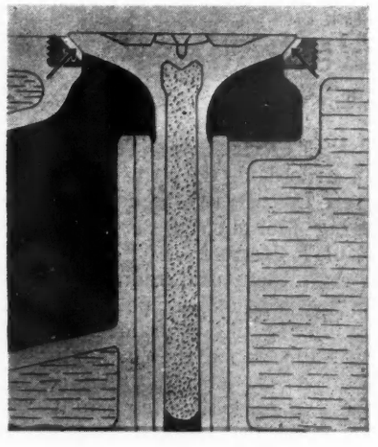


Fig. 2 — Bi-metal Stellited insert, screwed-in construction. Light portion adjacent to the valve is Stellite

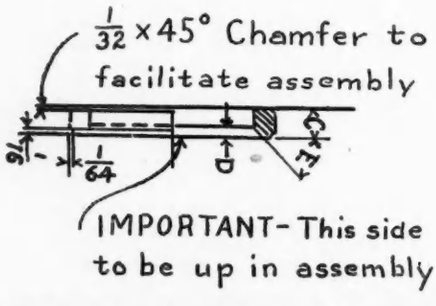


Fig. 1—Typical Buda insert of special alloy cast iron

Some of the larger fleet operators and service stations have used inserted valve seats for several years. This resulted logically from the necessity of servicing valve seats which were burned, pitted, or pounded out, on heavy duty equipment. In this type of service, valve seats had to be serviced frequently, and considerable metal had to be removed periodically, so that the very life of an expensive cylinder block was dependent upon the amount of metal below and around the valve seat.

For a time, some jobs were serviced by welding new metal into the worn seat. Perhaps this procedure still is necessary on certain old engines which do not permit the counterboring necessary for the ring. At any

TABLE I

NAME	Valve Insert	Material	Method of Application	Press Fit
Buda	Fig. 1	Spec. Alloy Iron	Pressed and rolled-in	0.006-0.007 in.
Haynes-Stellite	Fig. 2	Bi-metal	Screwed-in	
White Motor	Fig. 3	Bi-metal	Screwed-in	
Hercules	Fig. 4	Cast iron	Pressed and Rolled-in	
Waukesha	Fig. 5	Spec. Alloy Iron	Pressed	0.008-0.010 in.
Lycoming	Fig. 6	High tungsten steel	Pressed and Rolled-in	
Allis-Chalmers	Fig. 7	High speed tool steel	Pressed	0.003-0.007 in.
Autocar	Fig. 8	High speed tool steel	Pressed and Rolled-in	0.007 in.
Sheepbridge-Stokes	Fig. 9	Centrifugal cast iron	Spec. Press Fit	1½-2½-ton pressure

Grinding!

rate, the service field worked out its own salvation quite satisfactorily. We know of one large fleet operator in Philadelphia who used inserted exhaust valve seats made of a special grade of cast iron, more than five years ago. We are told by one of our friends in the service field that Yellow Cab of Chicago used inserted valve seats as far back as 1919.

In view of the possibility of a general adoption of inserted valve seats, we have gathered together a good deal of valuable information from various sources in the hope that it may be of service to engineers who are working on the problem.

A census of those who have adopted inserted valve seats includes the names of some of the outstanding

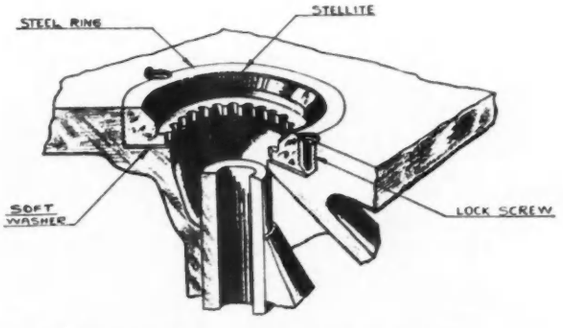


Fig. 3—White Co., insert of bi-metal construction, screwed into threaded seat. It is screwed down on a soft metal washer set in the base of the counterbore. Threads are painted with a bonding material for heat transfer and locking

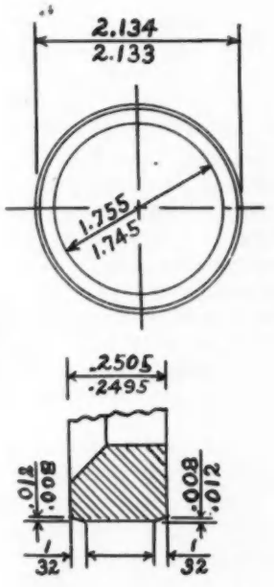


Fig. 4—Hercules insert of cast iron

organizations in the industry as will be evident from the list given in table I. To these, we may add Mack, General Motors Truck, and several others who are not yet ready to release the information; also Chrysler and Willys with high-speed steel inserts on both the four and six.

Correspondence indicates that there is a group of industrial engine builders who are awaiting the results of experimental tests before adopting the new construction. These and others are watching the outcome of experimental work by users who have taken the initiative and put in the valve seats on their own engines.

It is obvious from recent correspondence that many engineers are convinced of the desirability of employing inserted valve seats but prefer to rest their decision upon the verdict of service experience. For service alone will bring out the weakness or soundness of optional materials and methods of application.

According to a recent study by Haynes Stellite, the

inserted valve seat is a necessity on the current crop of engines because higher compression ratios, faster speeds, and more constant running at full load, all contribute to shortening the useful life of seats machined in a cast iron block. Moreover, the exhaust valve is subjected to high temperatures at which a deposit of an extremely hard substance is formed on the valve seat and valve. As the seat wears away or is pounded in, and the valve sinks deeper into the block, the clearance between the valve stem and plunger is diminished. When this clearance is completely taken up leaks occur and the engine may lose compression attended by rapid erosion.

The logical answer is to use some abrasion—and heat-resisting material which resists these conditions more successfully than the material used for the block or head casting.

According to Haynes Stellite, there are three major requirements of a valve seat material:

1. It must have approximately the same coefficient of expansion as the cylinder block material.
2. It must resist abrasion and softening at elevated temperatures.
3. It must resist the formation of deposits of foreign substances.

E. I. Williams, of P. R. Mallory, gives the following six criteria for an acceptable valve seat in a paper he read June 2, 1932, before the Automotive Engine Rebuilders' Association:

"1. It must stand up to its particular duty. With light passenger cars, we don't have much trouble with valve seats as a rule, and the cheapest kind of seat is, therefore, perfectly satisfactory. On the other hand, we have the very heavy duty, hot engines running at high speed, pulling trailers over mountains, and there we feel that the very best material that you can get is the cheapest in the end.

"2. The coefficient of expansion must be taken into consideration. The cast iron, of course, has approximately the same expansion as the block; the steels and alloys have not.

"3. High thermal conductivity to help cool the valve head. This is a very important item. Note the expense valve manufacturers have gone to to help accomplish this.

"4. Action on the valve. A material might make a perfect seat in itself but tend to injure the valve proper.

"5. Ease of installation and serviceing.

"6. The material should be cheap for the job it has to do."

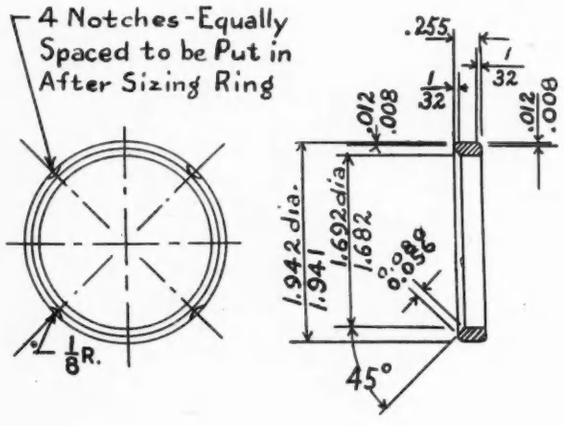


Fig. 5—Typical Lycoming insert of high tungsten steel. Note the four notches around the periphery to assure locking when the insert is rolled in place

A wide range of materials has been used for valve seat inserts starting with plain cast iron at one end and embracing Stellite and Elkonite at the other. In between there is the gamut of combinations some of which are noted in table 1. These include alloy cast irons, cold rolled steel, high speed steel, high tungsten steel, and various proprietary brands.

Obviously, the choice of material has to be made carefully on the basis of service requirements and the criteria mentioned above, together with a consideration of the costs involved since the material will govern to some extent the method of application.

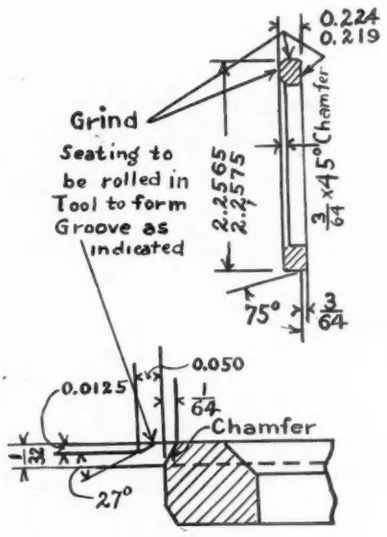


Fig. 7—Details of Autocar method of rolling in the high speed tool steel insert

Broadly, there are two general methods of installing valve seats. One which has wide acceptance consists in pressing in with a force fit and spinning over the block material so as to hold the ring in place. The other method, chiefly used in fitting the bi-metal inserts made by Wilcox-Rich is to thread into the block and anchor by means of set screws.

Inserted valve seats bring up a number of technical points which must be thoroughly investigated before any specific method is adopted in regular production. In the first place there is the moot question, quite disturbing to metallurgists, as to the relation between hardness and wear resistance. Bi-metal, Stellited seats made by Wilcox-Rich rely upon extreme hardness. Haynes Stellite in a recent survey finds White heavy duty engines have run 75,000 to 100,000 miles without needing regrinding or refinishing of the valves.

On the other hand, Elkonite, according to Mr. Williams, has entirely different properties. Although it is "soft" enough to be readily machinable in the field, it

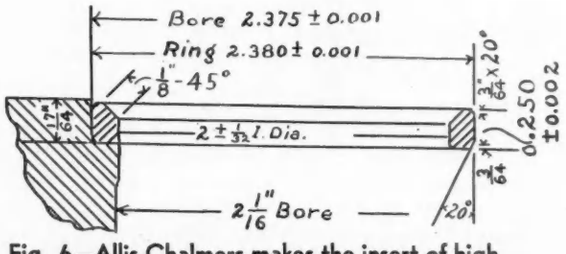


Fig. 6—Allis-Chalmers makes the insert of high speed tool steel and rolls in place for locking

is said to resist abrasion and wear to a remarkable degree.

B. B. Bachman, chief engineer of Autocar, prefers a seat of only moderate hardness. His company is using a high speed steel which is said to give very satisfactory results and yet may be trued up in service with ordinary tools.

Among the most important considerations is that of thermal conductivity. The insert material must conduct heat as well as does the block material, and better if the valve is to be maintained at reasonably low temperature. Low carbon steel has about 20 per cent better conductivity than cast iron while Elkonite is said to be about 275 per cent better.

The type of joint has a very important bearing on this factor. With press fits, the greatest care is needed in fitting to assure contact all around and at the bottom of the counterbore. For this reason, both the counterbore and ring must be held to close tolerances. As a further precaution, Buda insists upon a final inspection in which the ring after being rolled in, is tapped around the periphery with a light hammer. It is claimed that this checks the joint with great precision.

In a similar fashion, great care is needed in fitting threaded inserts to assure good conductivity. The White seat which is Stellite-faced and screwed in, is painted with a special solution to assist in a bonding action at the thread. This bonding material fills the clearance space between the threaded surfaces and thus aids in heat transfer.

Finally, there is the question of whether the seat is to be considered as permanent or replaceable in the field. Ostensibly, the current practice is to make the seats replaceable and it is claimed that they can be readily removed if necessary. However, some service men claim that it would be a rather difficult matter to carry this out in practice. This leads one to inquire whether the replacement feature is indeed essential. It is quite likely that service experience will demonstrate that a well-designed seat of the proper material will last as long as the block and require no other attention than that of truing-up after a long period of service.

Enough service data exists to establish some of the possible difficulties in the field. One of these is the possibility of trouble when using a pressed-in insert having a coefficient of expansion sensibly different from that of cast iron. One engine builder in the heavy-duty field reports that warping has developed in several cases with their high speed steel insert. To correct this condition, they have a procedure of regrinding valves after the usual shop test under heavy loads.

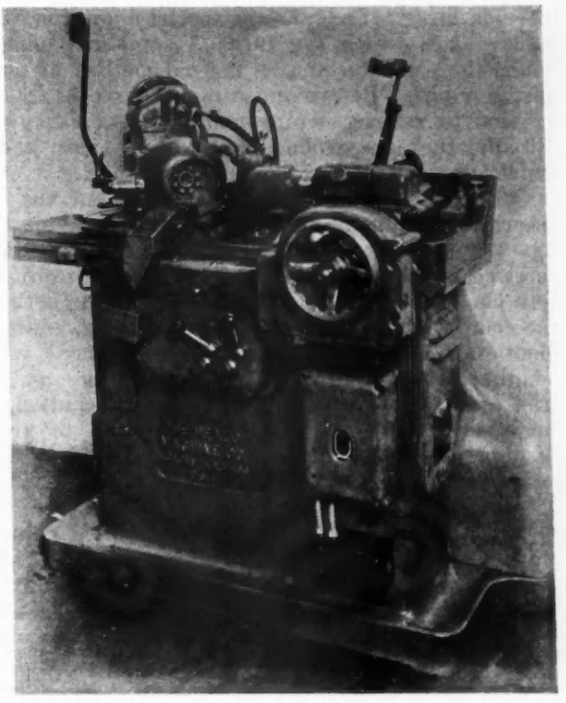


Fig. 9—Heald Sizematic grinder used by a large manufacturer for the economical high production manufacture of inserts. This set-up produces 450 pieces per hour from a battery of three machines

At the present time Wilcox-Rich is supplying valve seat inserts of various types to a number of engine builders. Dall Motor Parts Co., and Cedar Rapids Eng'g Co., have been supplying the replacement field with cast iron inserts for several years. This has led to a certain amount of standardization of sizes and proportions as is evident from the drawings which appear in this article.

In the present state of the art it is of interest to inquire into the methods employed in machining the inserts and fitting them in the cylinder block. Accordingly, the following section gives some high spots of the procedure in a number of well-known plants. This outline should prove to be of mutual interest.

European practice offers an interesting contrast. Consider the Centrilock construction described in *The Automobile Engineer* (Eng.) December, 1932. This is a centrifugally cast insert of cast iron made by Sheepbridge Stokes Centrifugal Casting Co., Ltd., (Eng.) and so designed, fig. 8, that it is locked positively in a recess formed at the bottom of the counterbore. The insert has two external diameters, the larger of which is compressed to pass through the small bore of the seat and then expands into the recess. This seat is put in to stay.

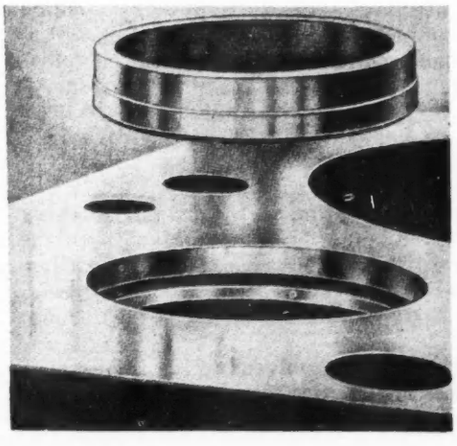
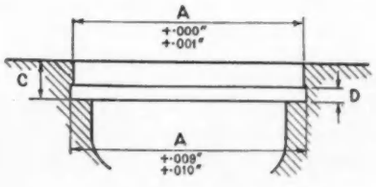


Fig. 8—Centrilock (Eng.) construction is unique. The seat is bored with a recess at lower end, the insert being machined with two external diameters to suit. Interference fits are so adjusted as to permit the large diameter of the insert to compress sufficiently to enter the smaller bore. Then the ring expands into the recess, making a rather effective but permanent lock



Buda inserts, fig. 1, are of special alloy iron, cast in hollow bars which are turned, bored and parted in much the same fashion as the old method of making piston rings. Before finishing, the rings are heat-treated to relieve strains and initial grain growth. Finally, they are ground flat on both sides, and cylindrically-ground on a centerless grinder.

Considerable development has featured the valve insert design finally adopted by White. As shown in fig. 3, it is a Stellite-faced bi-metal insert which is screwed into a threaded seat. Before the insert is set into place, a soft iron washer is laid on the bottom of the counterbore to serve as an elastic foundation. As mentioned earlier, the threads are painted with a bonding material which serves for locking and heat transference as well. As an added precaution, two small dowels are screwed into the head to prevent turning. After locking in place, the insert is finish-ground with a special high speed grinding wheel.

In production, the White seat is rough-turned from bar stock and then faced with Stellite puddled on from rod stock by an oxy-acetylene flame. Specially developed electrically controlled fixtures are employed in the process. Excess Stellite is removed by disc grinding, followed by rough grinding all surfaces and diameters before broaching. Broaching the serrations and sizing the inside diameter of the valve seat to close tolerances precedes finish-grinding and screw cutting. After finish grinding, the thread is milled to assure accuracy.

We are advised that The White Co. has applied for patents on certain features of valve seat construction described above.

The Autocar insert, fig. 7, is typical of the press fit construction in which the ring is pressed in with an interference fit of about 0.007 in. and is then locked into place by rolling or spinning the block metal over the chamfer turned in the insert. This procedure is followed whether the insert is of steel or cast iron except in a few cases where the spinning operation is not used.

According to Haynes Stellite, the General Motors Truck Company uses a combination of two methods for securing the valve seat insert. This company uses a threaded Stellite-facer seat similar to that used by White. However, the insert thread designed for an interference fit in its seat and at assembly it is shrunk to normal size by treating with Dry Ice.

The use of hard materials for valve seats has created a demand for special tools both in production and service. One of the outstanding developments is the Hall-Toledo high speed eccentric grinder which has been adopted by a number of automobile manufacturers. The wheel runs at 8500 rpm. and finishes the four exhaust seats of an eight cylinder engine in about 80 seconds. A small edition of this grinder has been placed on the market for service station use.

Another production machine to make its appearance in this field is the Heald grinder, fig. 9, which grinds the conical seat. Roundness and concentricity with the outside diameter are held to close limits in order to reduce the time required for lapping at assembly. A battery of three No. 81 Heald Sizematics with special workheads are grinding the valve seat insert at the rate of 450 pieces per hour in the plant of a well-known parts manufacturer.

The foregoing simply touches the high spots of this important development in engine design. The present intensive program of experimental work on the part of engine builders, users, and the manufacturers of valve seats and valves, should help to bring about a speedy crystallization of design practice, which will be of real benefit not only to those who have participated in this movement but also those who are ready to get into the swim.

Merimet Copper-Fabric Material Developed for Automobile Roofs

A NEW material suitable for covering the roofs of closed bodies has been placed on the market by the Standard Textile Products Co. of New York. It is called Merimet and consists of a thin sheet of copper bonded to a strong waterproofed cotton fabric with a special flexible adhesive which allows for the normal contraction and expansion of both the metal and the fabric.

A decking made of this material has decorative value and can be sprayed like other parts of a motor car body. The manufacturers point out that decking of attractive appearance is particularly necessary now that the tendency toward lower construction is bringing the roof more into view than it has been in the past.

The copper sheet used is rust-proof in itself, and the flexibility of the product is said to allow for the weaving motion of the body when the car is in motion.

In the application of Merimet, a piece of deckboard is spliced over the usual wadding. The purpose of the deckboard is to produce perfectly smooth lines in the top by eliminating the outline of the bows which are sometimes apparent on the roofs of cars we see.

After the deckboard is in place the sheet of Merimet is tacked at the rear of the roof and drawn toward the front. By means of a simple clamp and turnbuckle arrangement, the Merimet is drawn tight so as to eliminate both longitudinal and transverse wrinkles. It is then tacked in place and the usual moldings are applied.

For large-production work the clamp and turnbuckle arrangement is highly desirable, but in repair work the same effect can be obtained without this equipment in a little longer time.

According to the manufacturers of the material, it can be applied in the same time as the ordinary decking material, and they consider it probable that with the accumulation of further experience in its application, this time may be reduced. There is said to be no special problem connected with the lacquering of a Merimet deck.

The new material is being offered to the industry as having more than the required wearing qualities and lending itself to superior finishing.

JUST AMONG OURSELVES

K. O.'d by F.O.B.

A FEW months ago it looked as though all the car makers might be going to abandon f.o.b. price advertising and go exclusively to a delivered price basis. Circulating around one could find scores of executives in favor of the change and practically none opposed to it any more.

But now it seems to have turned out to be one of those cases where three instances—or even thirteen—do not constitute a trend. Only one or two of the right companies need oppose the idea to make it dangerous and difficult for the rest to adopt so definitely new a practice. And there, it is our guess, the matter will rest for some time to come—if not forever. We still think delivered price advertising will come sometime, but the prospects are less bright today than they were two months ago.

Parts Makers Cheer

NEVER before were parts makers so interested in the maintenance of reasonable vehicle prices. Every price cut in recent years has meant more demands for still lower prices from parts purveyors. Sometimes of late these bedeviled gentlemen have come to wonder whether there was any limit to what might be expected of them.

And their workers have felt the pressure of low prices as well. Some men close to the situation are inclined to blame low price demands for at least part of the labor troubles which have been springing up sporadically about the middle west in recent months without any particular nation-wide publicity. Certainly indirect pressure often is just as strong as direct.

Truckmen Must Sleep on Their Arms

THE Highway Users Conference and the American Association of Railway Executives came out without making detailed recommendations as to the argumentative questions of rates and dimensional limitations.

So is borne out our statement of Jan. 14 to the effect that "we'll be much surprised if argument about *rate control* and *dimensional codes* does not continue stubbornly both inside and outside of committee doors."

We are still of the opinion that the automotive industry will have to fight and fight hard to prevent unfair and uneconomic legislation in the 1933 state Legislatures.

A Problem That's Self-Solving

NOT thinking about the automobile business at all, somebody wrote not long ago:

"Too much duplication in distribution. The market has a definite size. Duplicating distribution units do not make the market larger. They make profit smaller. Take duplication out of distribution and we could almost live on today's volume."

Luckily, though, the paragraph was read by an automobile man, who sent it to us. Certainly it applies to our industry. As a matter of fact a good bit of duplication has removed *itself* from the automobile retail business of late, and more will do so before spring if business doesn't get better quick.

The Detroit National Show

THE idea of holding one big National Automobile Show each year and locating it in Detroit came into the limelight again last month while the Detroit Show was in progress. Aaron DeRoy, veteran Hudson dealer of the motor city, got out a statement favoring such a move and was rewarded by leading editorial attention in at least two of the big Detroit dailies.

Despite the editorials, we don't think there will be any National Automobile Show in Detroit or that the New York and Chicago exhibits will be made locally-handled affairs—at least for some time to come.

Such casual executive opinion as we have gathered in the month or so since DeRoy's statement was made, is strongly unfavorable to such a move. In fact, we don't think it will even get to the serious argument stage this time any more than it did when first urged some years back.—N.G.S.

Inflation

No Royal Road to

Not more money but more bank credit based on the demands of increasingly active business, needed to lift prices

By Col. Leonard P. Ayres

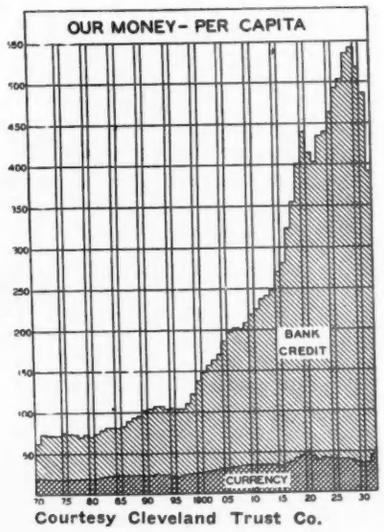
Vice-President, Cleveland Trust Co.

CHEAP money is being advocated at Washington and discussed throughout the nation, as it was during the free silver campaigns in the depression of the 90's nearly 40 years ago, and in the greenback campaign in the depression of the 70's nearly 60 years ago. More than a score of bills embodying projects for inflation are before the Congress, and numerous others are in preparation. In this respect the developments of this depression are running true to historical precedent.

The impulse behind the movement is simple and natural. It is that nearly all of us have less money than we did have two or three years ago, and so it is easy for us to conclude that if the government should create a substantial amount of new money, and put it into circulation, we should all be better off. Moreover we remember that during the war the government did cause a large expansion in the amount of money, and we know that we then had a period of sustained business prosperity. History tells us that the same developments took place during earlier wars.

During the World War and following its close nearly all the belligerent nations spent money faster than they could raise it by taxation and borrowing, and printed additional paper money to make up the difference. In some countries the paper money became valueless or nearly so. Among them were Russia, Germany, Austria, Hungary, Poland, Bulgaria, and Roumania. In a long list of others the depreciation of values was extreme, but not complete. Among those in which the exchange value of the money fell to less than one-fifth of its par value were France, Belgium, Greece, Italy, Portugal, and Yugo-Slavia. In all these countries inflation had the effect of rewarding speculation and penalizing thrift. It was born of unbalanced governmental budgets, and it fostered public and private extravagance as it grew.

There is a fundamental difference between these historic instances of monetary inflation and the proposals we are now discussing in this country. It is that in all the cases cited the nations adopted inflation unwillingly and through compulsion, while we are discussing it as a policy that might be entered upon voluntarily in the hope that it might stimulate busi-



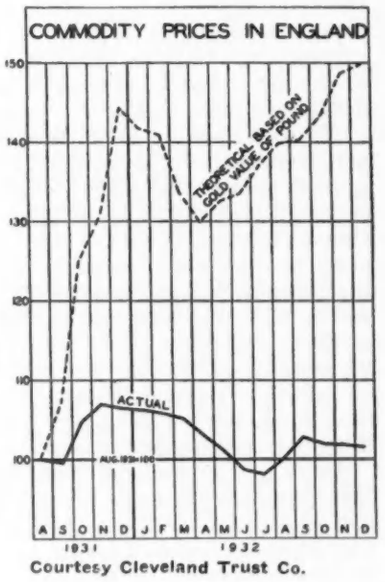
There is more currency per capita now than in 1929. It is bank credit that has contracted

Courtesy Cleveland Trust Co.

"The unprecedented fall of commodity prices in recent years has caused a growing disequilibrium between costs and prices, has immensely increased the real burden of all debts and fixed charges, has made business more and more unprofitable, and has resulted in a continuous and disastrous increase of unemployment throughout the world. Some increase in the level of world prices is highly desirable and would be the first sign of world recovery."—From the agenda submitted by the preparatory commission of experts for the World Monetary and Economic Conference.

Currency inflation, its protagonists say, would give prices the needed boost, but Col. Ayres by digging into the fundamentals of the subject, shows that the alluring picture they paint is a delusion.

Reflation



England has a form of inflation but it hasn't lifted prices

Courtesy Cleveland Trust Co.

ness activity. Such an undertaking would be an entirely novel experiment, for never in history has a nation voluntarily debased its currency to test whether or not the change would result in trade expansion and business stimulation.

As one studies the bills that have already been presented in the Congress, it becomes evident that we have here no mere diversity of projects all aiming to attain the same result by differing procedures, but rather groups of bills all seeking to produce inflation, but proposing to use it for most diverse reasons and purposes. The bills may be roughly classified into three groups on the basis of their objectives.

In the first group are those that seek inflation primarily for the benefit of special classes of people in our population. Examples of such legislative projects are those that would print some billions of new money for distribution to the veterans in payment of their bonus claims.

Other projects designed to favor special interests are those that would issue large volumes of new currency for the refinancing of farm mortgages at their face value, or for lending on farm properties in amounts up to high percentages of their appraised values. In the same group of special interest projects may be included most of those aiming to remonetize silver at levels well above its market value, for nearly all of these originate in the silver producing states, or can be directly traced to them or the mining interests operating in them.

In the second group of inflationary projects are those designed to lift the levels of commodity prices. They are diverse in character. Some are mere instructions to the Federal Reserve Board to manipulate credit and note issues in ways that will raise prices, while others propose elaborate new monetary systems based on constantly changing the gold content of the dollar. The third group of inflationary projects consists of those designed to cause a direct stimulation of business activity. They range in scope from plans by which the treasury would issue some billions of notes to pay for great programs of public works, to proposals for issuing money to finance an expansion of industrial production up to prosperity proportions in the hope that the creation of the larger supply of goods would induce the demand that would consume them.

A simple general definition of monetary inflation is that it is the expanding of the volume of money and credit more rapidly than is needed by business. Usually the result is to make prices rise. However, an examination of the provisions of the inflationary projects that have been submitted to Congress leads to the conclusion that it would be extremely difficult to devise a modification of our money system that would successfuly operate to cause a general advance in our price levels. Certainly most of the projects that have so far been submitted at Washington would fail to have that effect.

The first reason for the difficulty lies in the fact that most business in this country is conducted by credit and not by currency. Most payments are made by check, and not by the passing of actual money. Most of the inflationary projects that have been submitted provide for the printing of additional paper money, but what we need in order to lift prices is an expansion in bank credit. Our price collapse has been accompanied by a great shrinkage in the volume of our bank credit with which we do most of our busi-

ness, but not by a reduction in the amount of our currency. Our loss in bank deposits, which are mostly bank credit, has amounted to about 15 billion dollars since 1929, or to some 26 per cent, while our volume of money in circulation has actually increased.

It might be a simple matter to enact legislation providing for the printing of some billions of treasury money and its payment to some group in our population, but if we suppose that we should thereby cause a proportional lift in our prices we are mistaken. In 1931 we did pay out about a billion dollars to veterans in bonus money without causing any real increase in business or any advance in prices.

In 1932 our national debt increased by about three billion dollars, which means that the government spent that much more than it received from taxation and tariffs. The government might have met the deficit by printing federal money instead of by issuing federal bonds, and except for the alarm that it would have engendered, that printing of new money would not have had any more effect on our price levels than the issuing of the new bonds did. The evidence is cumulative that the increasing of the volume of our currency by one or two or three billion dollars, as most of the new projects propose, would not be effective in lifting our price levels.

We now have in circulation about $45 of currency per capita of our population, and not far from $400 of bank credit. Each additional billion dollars of new currency that might be brought into existence would amount to eight dollars of new money per person. In order to raise our price levels we do not need to have the present $45 of currency per person increased to $50 or $60. We need rather to have the $400 of bank credit increased to $500 or $600. The increases that we need in our money and credit combined in order to raise the general levels of prices are far greater than those we can get by printing new paper money if we are to keep that money redeemable in gold.

There is a crucial difference between the war-time inflations that we know about and the depression inflation projects that we are discussing. In time of war business booms because the government is purchasing goods on a grand scale. Much the same effect is produced in the periods of replenishment of stocks that follow great wars. Such times are characterized by credit expansion, and if monetary inflation is also under way great advances in price levels are produced. It is true that great business activity accompanied by large scale inflation of money and credit will raise prices, but it is not true that during a depression a small inflation of currency alone will either create business activity, or cause credit expansion, or raise price levels.

There is another and even more formidable reason why we are not likely to be able to raise prices as the direct result of any changes we may make in our money system providing we retain the present gold basis for our currency. It is that the proposal to lift our price levels through monetary manipulation is in reality the proposal to lift the price levels of the whole world. The gold prices of wholesale commodities entering into international trade are always about the same all over the world, after allowance is made for the costs of transportation and taxes. The gold prices of these basic commodities largely control general price levels. No one nation acting alone can hope to control or even greatly influence them.

An essential characteristic of all the historic inflations is that they have been caused by the printing and circulating of large volumes of paper money not redeemable in gold or silver. If we should abandon gold as the basis for our money and then print and circulate large volumes of paper currency we could carry the process far enough to lift our price levels. Another method of inflation that is much discussed would be to reduce the amount of gold in the dollar in the expectation that prices would rise in proportion as the gold content was reduced.

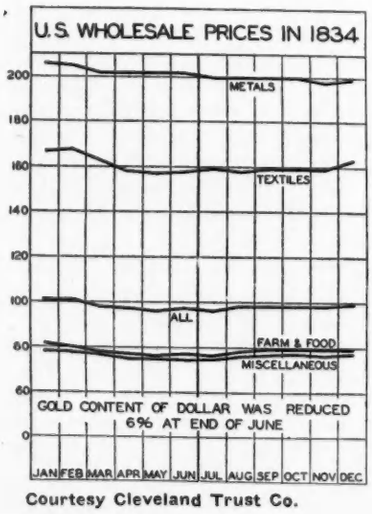
Gold is the Standard

All such projects are probably impossible of realization. There seems to be no method within the realm of political realities by which this country could voluntarily abandon gold for its money, or reduce the gold content of the dollar. The reason for this is that all our federal bonds, most of our state and municipal bonds and most of our corporate bonds are promises to pay in dollars equal to gold dollars of the present weight and fineness. Moreover the Supreme Court has rendered decisions declaring such gold payment contracts valid irrespective of whether our money is on the gold standard or off it. Such conditions do not exist in other countries.

If a bill to reduce the gold in the dollar were seriously considered in Congress it would produce protracted debate, and if enacted into law its constitutionality would be argued before the Supreme Court. While the congressional debate was going on everyone having money would attempt to convert it into gold in the expectation that the new law would increase the number of his dollars without any effort or risk on his part. Sufficient gold to meet such demands does not exist, and if the Congress should be so foolish as to enter upon the debate that would initiate a world-wide run upon our vast supplies these would promptly be exhausted and we should be forced off the gold standard.

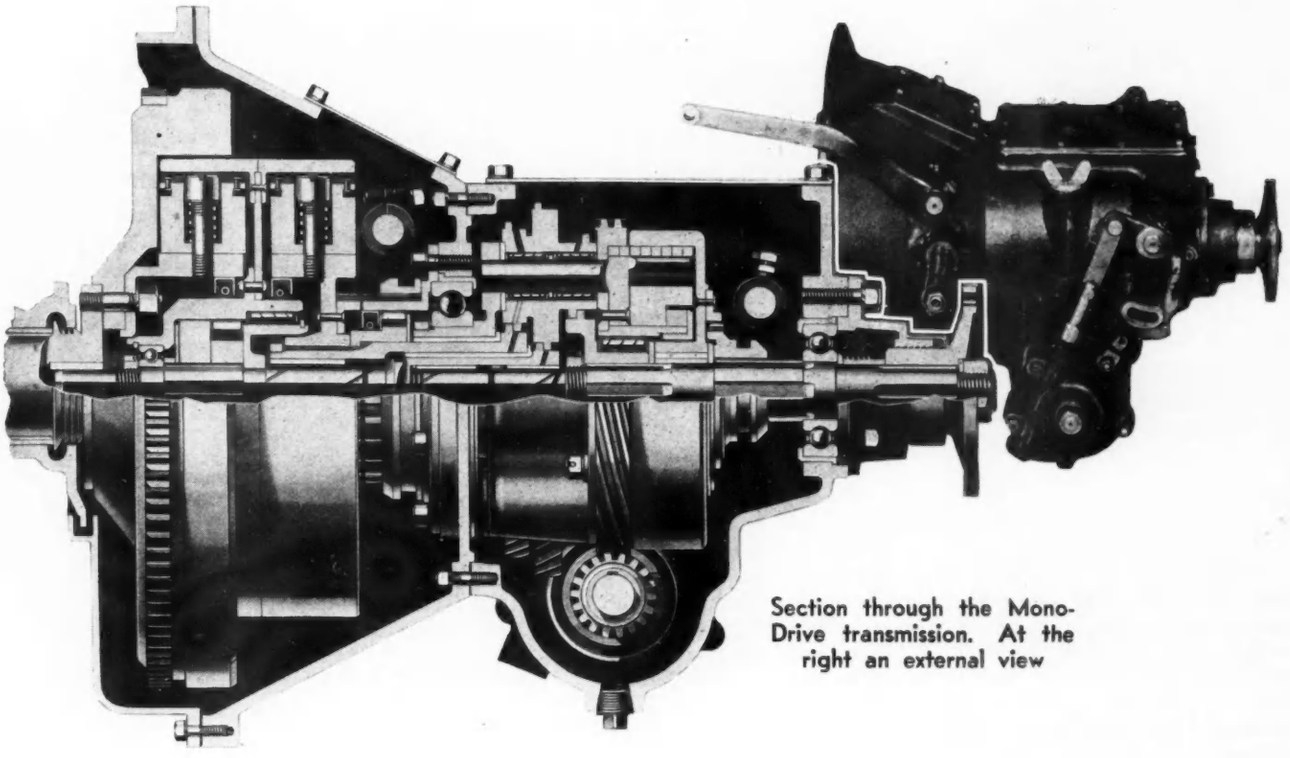
If all these difficulties should somehow be surmounted, and we should suddenly learn that the gold content of the dollar had been reduced by one-third, the results would probably prove most disappointing to the proponents of the change. The number of dollars in our bank accounts would not have increased, the goods in the country would be the same in volume, and price advances would probably develop slowly. Foreign goods would cost us more in dollars, so our imports would decline, and our goods would cost for-

(Turn to page 213, please)



Courtesy Cleveland Trust Co.

Reducing the gold content of the dollar didn't raise prices in 1834



Section through the Mono-Drive transmission. At the right an external view

Torque Reversal Shifts Gears

Mono-Drive automatic transmission changes gears when accelerator pedal is released

by Athel F. Denham,
Field Editor, Automotive Industries

AN automatic shift transmission in which the shift between gear speeds is accomplished silently and positively without the introduction of any other actuating means than torque reversal has been developed by Oscar H. Banker, with the backing of the Magill-Weinsheimer Company of Chicago.

Called the Mono-Drive, this transmission permits the elimination of both clutch pedal and gearshift lever from the car, and for normal driving the only controls used are the accelerator and brake pedals, and the steering wheel.

Shift from low into second and from second into high is accomplished by releasing the accelerator pedal briefly. The shift from low into second in the transmission in the car which the writer drove can be accomplished at any speed above about 5 m.p.h., while from second to high can be made anywhere above 9-10 miles per hour. On the other hand the car can be accelerated in low up to some speed above ten miles per hour and shifted directly into high by releasing the accelerator pedal for a longer interval. Also the car can be accelerated in second speed up to 40-45 miles per hour if desired, before shifting into high.

On the downward shifting side, there is an automatic shift from high into second any time car speed drops below ten miles per hour, and into low below 5 miles per hour, whether or not power is applied at that time. An auxiliary pedal was provided in the car (in place of the normal clutch pedal), which could be depressed if it was desired to shift from high into second at any speed above 10 mph.—as for passing cars on a hill for instance.

A dash control is provided for reverse engagement, and also to place the transmission in "neutral" for

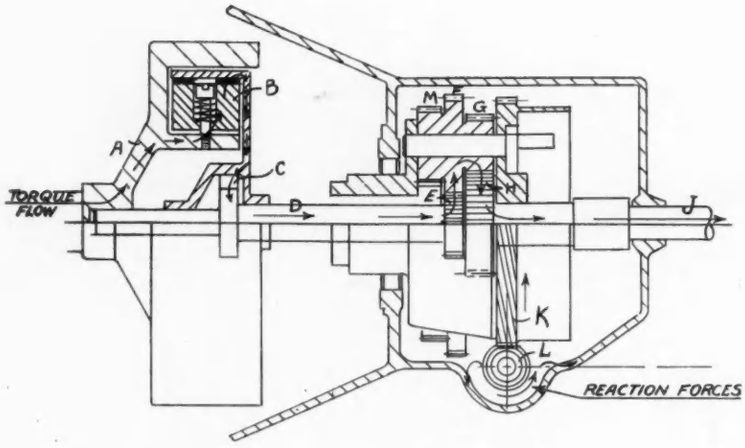
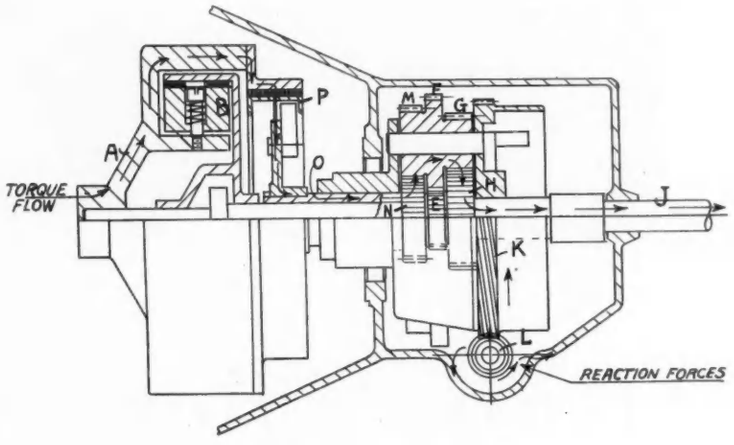


Fig. 1, left—Low gear

Fig. 2, below—Second speed



warming up purposes. In the third position, "forward," the car will stand still as long as the engine is idling.

There is no master clutch in combination with the Mono-Drive transmission. Rather there are a series of internal expanding "brake" type clutches for engagement of the various speeds. Engagement of these clutches (which are provided with lining in the normal manner) is centrifugal but almost instantaneous in action in the case of second speed and high, so that there is a minimum of slippage.

The cut on page 197 shows a section through the transmission of the present type. A number of improvements, simplifying the design and improving quietness have been made in a later design, illustrations for which are not available.

Basically the transmission is of the planetary type, with the planetary carrier mounted in such a manner that when torque is applied it is stationary, and reaction is taken by the case, while when torque reverses, the carrier can move through the provision of an over-running clutch.

A series of sketches—Fig. 1-4 are given here to illustrate the action, each showing only those parts which are brought into action. In low gear, Fig. 1, when the accelerator is depressed, flywheel A accelerates centrifugal clutch B engaging sleeve connected through over-running clutch C on shaft D to shaft D and gear E on this shaft. Gear E drives gear F of the planetary cluster (of which there are two), and G of this group drives H on the end of propeller shaft J. The reaction of the planetary gears is taken by the gear K on the carrier to shaft L, crosswise of the housing. On one of the ends of shaft L there is an over-running clutch to stop the planetary carrier in its effort to turn backwards when the power is applied, the reaction being taken up in the housing.

The third gear of the planetary cluster M is in mesh with a gear N mounted on a hollow shaft O surrounding shaft D (see Fig. 2.) On the other end of shaft O is a second automatic clutch P. It is obvious that when (in low gear) sufficient engine speed has been reached, centrifugal clutch O will expand against the flywheel. This occurs at about 10 m.p.h. car speed.

However, since there is a two to one reduction from gear E to gear N, clutch B will continue to drive, clutch P slipping. Clutch P incidentally is not of the gradually expanding type, but is held in the retracted position by a ball lock until the critical speed is reached, when it expands completely to the limit of its engagement.

The centrifugal clutch used in the Mono-Drive transmission

The planetary gears and their carrier

At any time after clutch P is engaged, if the foot is lifted from the accelerator, over-running clutch C will begin to freewheel, and clutch B will be disengaged, leaving the transmission engaged in second through clutch P. The arrows of Fig. 2 show the flow of torque under these conditions.

It will be noted that up to this time there has been no effect on the planetary carrier K, except to take the reaction forces through the cross-shaft to the transmission case.

Fig. 3 shows the transmission in direct drive. When the car is in second speed, and the accelerator is released, slowing up the engine, gear H becomes the driver, and causes the planetary carrier reaction forces to be reversed. Since there is a one-way clutch on cross-shaft L, this results in rotation of the planetary carrier K in the same direction as gear H and faster than gear H. This causes spring clutch Q to expand and lock the planetary carrier to the driven drum. The car is now in direct drive and acceleration will cause the planetary assembly, driven drum, etc., all to rotate as a unit. The larger arrows in Fig. 3 show the flow of torque under the new conditions.

If it is desired to shift into second from high without losing car speed, a manual control provided disengages jaw clutch R, which disengages the driven drum from tailshaft J. The drive will then again be taken as in Fig. 2.

Reverse is also engaged manually, as shown in Fig. 4. When sliding clutch S is engaged with gear U, hollow shaft D and gear N are thereby prevented from turning in the case. Engagement of clutch S is accompanied by disengaging clutch R and the over-running clutch on cross-shaft. In this condition the transmission is now of the conventional planetary type, gear M revolving around stationary gear N, which takes the torque reaction. In neutral position, all clutches, S, R, and on cross-shaft L are disengaged.

It is understood that a number of changes have been made in a later design, involving a rearrangement of units. The principles under which the transmission operates, however, has not been changed. The first unit, complete with bell housing and clutches, weighed approximately 200 lb. For production the designer estimates a total weight of around 130 lb. A no-roll-back device and mechanism by which the car can be definitely locked in low gear if desired, are available, but not shown here.

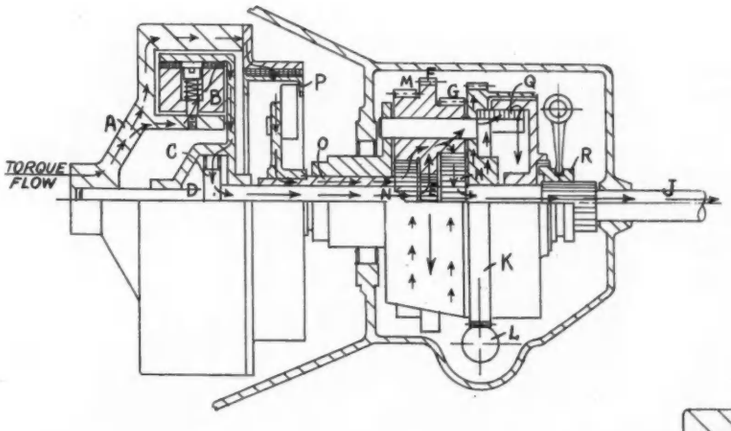


Fig. 3, above—Direct drive

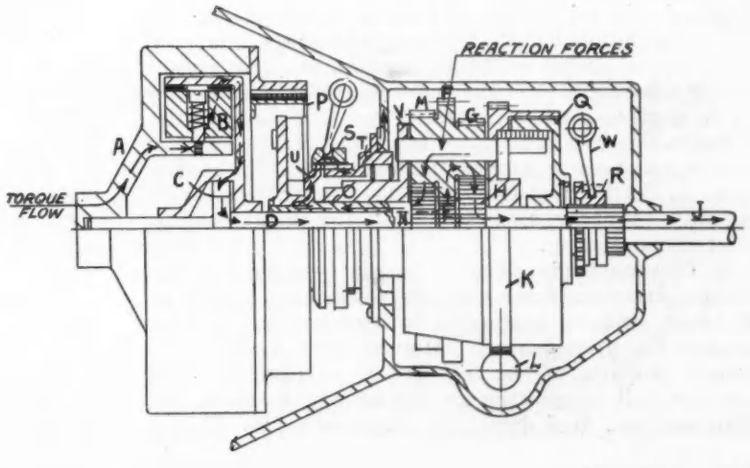


Fig. 4, right—Reverse

French Engineers

Frown on Rear Mounted Engines

Pioneer in This Type of Construction Says Complexity of Controls Alone Is Enough to Bar It

A REAR mounted engine is not the best solution of the problem of the general layout for passenger car chassis, according to conclusions reached by Emile Claveau in a paper presented recently before the French Society of Automotive Engineers. M. Claveau was one of the earliest advocates of the rear-mounted powerplant and has had considerable practical experience with the design and construction of cars of this type.

The disadvantages of the rear-engined car, which M. Claveau considers more important than its advantages are outlined by him as follows:

1. Reduction of the habitable space for a given length of wheelbase; that is to say, too much of the available space is occupied by the machinery.
2. Baggage is very difficult to provide for.
3. It is impossible to build a commercial car with this arrangement.
4. Control connections cause too much difficulty. "Think of the clutch operated by a pull rod; of the transmission controlled by two shifter rods, of the accelerator controlled through a link; of the length of the oil tube from the engine to the pressure gage on the dash; of the starter connections, the ammeter connections, and of the thermometer connections—if you use these accessories. Just imagine the complication of all these controls with their guides and supports, their levers and bellcranks. Evidently there is nothing in all this that is theoretically impossible; neither is there anything impossible in practice, but all of these controls, whose installation is laborious and whose adjustment is delicate, are a continual source of disorder, whatever precautions may be taken in their design and installation."

M. Claveau concluded his appraisal of the rear-mounted powerplant by saying that if it had no other disadvantages, this complication of its controls alone would have induced him to give it up.

In 1923 and 1924, M. Claveau took out in France, England, United States and other countries patents on a streamlined car with powerplant at the rear, and an all-metal body, of which the Burney car was a rather close copy, even the spare wheel being arranged in the same way as in his car. The only real difference between the two cars was that while in the Claveau car the engine was located forward of the differential gear, in the Burney it was to the rear thereof, overhanging the rear axle, which arrangement he considered undesirable.

M. Claveau made claim to having been first to develop a streamlined car with the powerplant located at the rear, and he proceeded to explain why he had chosen that arrangement. Having come to the conclusion that one of the features of an ideal car was a power unit comprising an engine, clutch, transmission gear and final drive, the question arose—Where shall it be located? The decision to use an aerodynamic or streamlined body, blunt in front and pointed at the rear, at once led to location of the powerplant in the rear, pointed portion, but forward of the driving axle, which latter was coaxial with the differential. No consideration was given by him at that time to a forward location of the powerplant with drive to the front wheels, for the simple reason that front-wheel drive was practically unknown then and M. Claveau considered he had enough problems to work out as it was without undertaking the development of front-wheel drive.

During a period of six years, from 1923 to 1929, M. Claveau studied the car with rear-mounted powerplant, and between 1926 and 1929 he built several such vehicles. He has had a good deal of driving experience with cars having the engine located at the rear and therefore considers himself competent to reply to the arguments in favor of rear mounting which Sir Denistoun Burney presented to the S.A.E.

Three years ago he turned his powerplant end for end, and he now drives through the front wheels, which serve both as driving and steering wheels. He did not make this radical change light-heartedly, since he fully realized that he exposed himself to the ridicule of those who only too often forget that *"la critique est aisee, mais l'art est difficile."* But he definitely decided that the engine must not be at the rear.

In the discussion which followed the presentation of the paper M. Martinuzzi, who was in this country with Louis Coatalen when the latter brought over a Sunbeam racer for an attempt on the speed record at Daytona Beach some years ago, said that one objection to both rear engine mounting and front-wheel drive, was the unequal weight distribution between the driving and non-driving wheels. Owing to the relatively large proportion of the weight on the driving wheels, these wheels should be fitted with substantially larger tires than a conventional vehicle. One alternative is to increase the size of all four tires, which is a simple solution but involves an increase in tire cost of nearly 100 per cent; the other, to put dual tires on the rear (driving) wheels, which increases the cost somewhat less than 50 per cent, but is not so simple.

It would seem to us that this argument does not hold so far as front-wheel drive is concerned, in which it is difficult to get even 50 per cent of the weight on the front wheels when allowance is made for the transfer of weight from the front to the rear wheels by the driving torque.

Micromatic Mirror Finish Improves Accuracy of Honed Cylinders

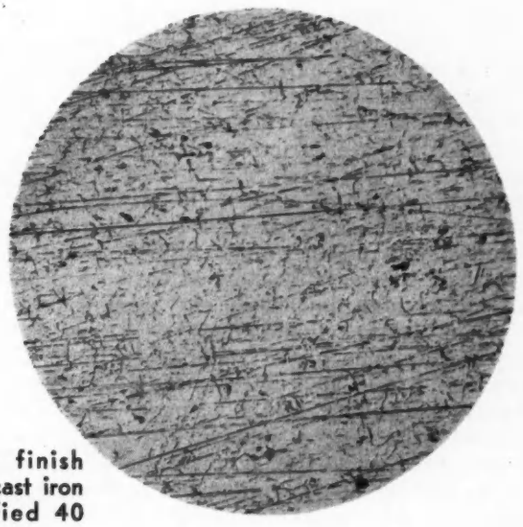
By Kirke W. Connor
President
Micromatic Hone Corp.

A Block in 51 Seconds

ADOPTION of the new mirror-like micromatic honing process by two divisions of the Chrysler Corporation and one division of General Motors focuses attention on the honing tools and technique recently developed by the Micromatic Hone Corp. The process adopted by these car makers comprises a combination of roughing and finishing operations yielding a production of over 70 blocks per hour. Bores are held within limits of under 0.0003 in. for roundness and 0.0005 in. for total taper.

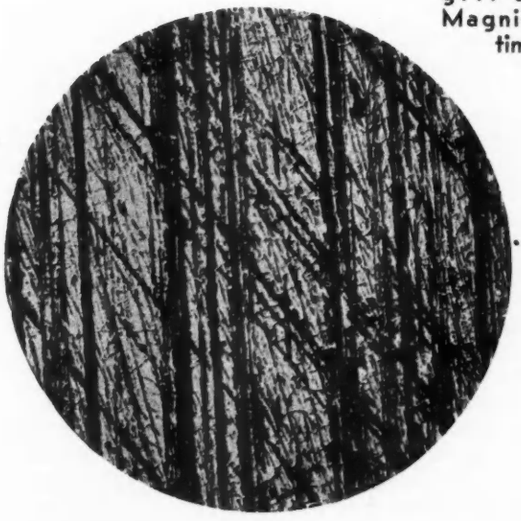
Both the roughing and finish-honing operations are accomplished by either full automatic or semi-automatic tools made by the Micromatic Hone Corp. Both the hones and the process are protected by U. S. letters patent, issued or pending.

Approximately seven years ago the honing process practically replaced the internal grinding of cylinder bores and another step forward was made in improving both finish and accuracy. During this period, by the use of the old-style manually adjusted brake-type honing tools, it was possible to obtain a fairly high degree of finish at the sacrifice of accuracy by allowing the relatively hard, coarse stones to become glazed so as to give a burnishing effect. To lay the surface of the metal back, in this manner, requires excessive pressure and causes frictional heat to the extent that distortion results. This method fills the previous honing scratches by crowding the metal into the cylinder walls to the extent of increasing the bore size by two or three tenths of a thousandth on the diameter. The excessive intermittent high pressure of the old method, together with the burnishing action of the stones, generates localized frictional heat to the extent that it has been, in some cases, found necessary to install refrigerating means to lower the temperature of the coolant. The adjustable head of the former brake type



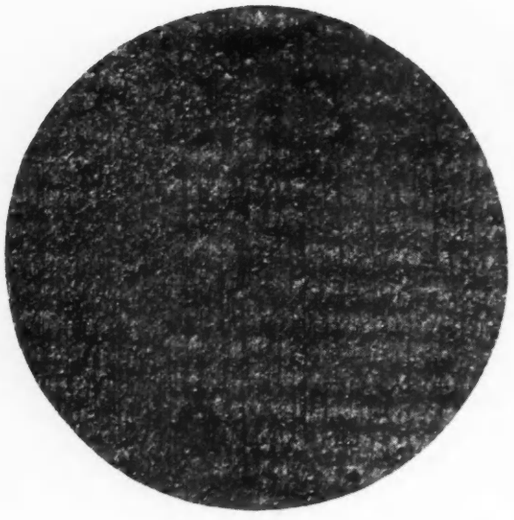
Mirror finish honed cast iron magnified 40 times.

First honing on cast iron, 150 grit stones. Magnified 40 times.



tools permitted a maximum production of only 30 to 40 blocks per hour.

It is obvious that these previous steps have lessened the initial wear of the cylinder walls and thereby increased the life of the motor. However, investigation made in the mid-western States indicates that the average, present-day automobile motor, equipped with the usual high pressure lubricating system. will not operate efficiently after running upwards of 25,000 miles. This is almost entirely due to cylinder wall and piston ring wear.



Reamed cast iron magnified 14 times.

It is the writer's opinion that the wearing factor of the cylinder walls is still the "weakest link in the chain." This conclusion is reached by taking cognizance of the fact that all such parts as the main and connecting rod bearings, together with camshaft and other working parts, will function satisfactorily for a distance upwards of 85,000 miles before replacement is required.

Piston and ring friction amounts to upwards of 40 per cent of the total friction losses in the average internal combustion engine. Notwithstanding the fact that the coefficient of friction between the pistons and cylinder wall is very much higher than that of the bearings, considerably more attention has been given to lapping high finishes on the bearing surfaces.

When used in cylinders honed with very coarse abrasive sticks, some piston rings reach the end of their economic life in 3000 miles, and in extreme cases (in the reconditioning field), where a relatively rough-bored finish is used without honing, they are completely worn out at the end of 500 miles.

The leading piston ring manufacturers have made extensive tests to determine the initial time required to wear piston rings into a full bearing seat when used in cylinders finished with the mirror process. The result of this work indicates that the time is not excessive and so much is to be gained in the way of cylinder wall and ring life that they strongly advocate the highest possible degree of finish.

Recent development in the efficiency of oil control rings has necessitated the use of a much more narrow land or face. This also presents new problems in ring life and the use of the Micromatic mirror finish on the cylinder walls naturally assists in producing satisfactory results.

The Perfect Circle Company of Hagerstown, Indiana, recently developed a new and interesting indicator to gage the degree of cylinder wall finish. This eliminates the human element in determining results and now makes it possible to set up new standards as definite factors. The indicator dial is calibrated for close reading. However, it is also divided into three general classifications. Grade A represents mirror finish produced with 500 grit honing sticks; Grade B honed with 150 grit stones, and Grade C to cover the range of finish produced by boring with tungsten carbide tools (cutter sharpened after each operation).

Some recent dynamometer tests, made to indicate relative frictional losses on various types of cylinder finishes, showed a maximum increase of ten horsepower after a 36-hour run on an eight-cylinder engine, with cylinders finished with the new Micromatic tool.

The conditions outlined above have prompted the Micromatic Hone Corporation to offer the automobile industry honing tools which produce the high mirror-like finish in such a form as to be entirely within the limits of manufacturing on a high production basis at a very nominal cost.

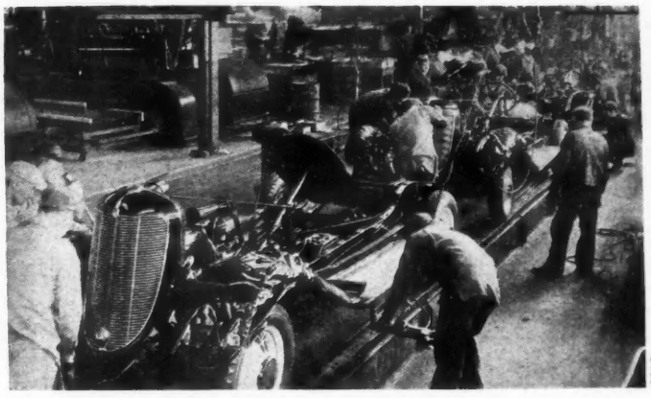
New Mirror—Like Honed Finish

The mirror-like lustrous finish is effected by the use of a secondary honing operation in which from 0.0007 to 0.001 in. stock is removed to entirely eliminate the previous honing scratches. This comprises the use of a new Micromatic hone known as Model 1A-Z-F, which gives a free cutting action with very fine grit stones, operating at somewhat higher rotating and reciprocating speed. Minute accuracy is maintained by providing means to avoid excessive pressure against the cylinder wall. Excessive frictional heat is entirely eliminated by the free cutting action and by reducing the surface area of the abrasive members.

The general construction of the hone head mechanism is very similar to that previously used on Micromatic tools which are now employed for the regular standard one-honing process on over 85 per cent of all automobile cylinders produced in this country. Considerable change, however, has been effected in the design of the body of the hone. One of the outstanding features is that it carries four non-abrasive resilient guide members to permit high speed automatic operation without marring the finish when the tool is extracted from the bore, in the collapsed position.

The new method of operation employs approximately 25 per cent increase in rotating speed, stepping up the reciprocation about 40 per cent and cutting down the surface area of the honing sticks in proportion.

The head mechanism of this new tool automatically feeds out the abrasive members under uniform controlled pressure during the entire honing cycle so as to assure a sharp, free cutting action from the comparatively soft stones. This feature is responsible for the increased accuracy obtained as an amount of 0.0005 to 0.0007 in. stock is removed without generating any appreciable frictional heat.



PRODUCTION LINES

The first of the 1933 De Soto chassis coming along the production line

Neglected Hinges

Nobody seems to give the poor neglected door hinge a thought. Yet, several designers have expressed themselves strongly about the need for a radical change. Henry Dreyfuss, for example, says that the exposed hinge is passe. He feels that the hinge should be concealed if we are to clean up the exterior of the new bodies. Of course, the concealed hinge means closer and cleaner door joints which brings up other problems. Nevertheless, it seems to be well worth thinking about. What say you?

Behind the Scenes

We didn't realize the costly detail behind the building of die heads until we visited the Landis Machine Co. recently. On the shelves in their tool department is an assortment of about 8000 master blocks, each one a replica of a chaser holder made in recent production. Many of these master blocks were made in filling orders for only one or a few special die heads or chasers. Yet a master must be made up to assure service replacements or possible repeat orders. Just a matter of good service to the user.

Service Plus

Then again, in another section, we saw an assortment of at least 5000 hobs used in making chasers of various pitches and thread forms. This number would be many times greater were it not for the fact that each hob can be used for a wide range of pitch and diameter combinations. Which is a fortunate property of the Landis product. Thus a 14 pitch hob designed for making 14 pitch U.S.F. chasers can be used for any range of diameters from ¼ in. to 7 or 8 in. depending upon the size of the die head. It's quite instructive to look behind the scenes occasionally and see the problems of the other fellow.

Kills Termites

Federal Motor Truck now primes all assembled frames for bodies and cabs with Protection Germicide Solution, a waterproofing preparation containing a 5 per cent germicide solution. It is odorless and is said to prevent the attack of insects such as termites and fungus growth.

Reducing Noise

Fisher Body had a very interesting exhibit at the N. Y. Show, giving the low down on body construction, upholstery materials, and ventilation. The new Fisher bodies avoid wood-to-wood squeaking by eliminating direct contact of wood-to-wood at the joints. Joints now are made by fastening the wood members to a common metal bracket or strip. Bolts or screws, instead of glue now carry the load.

Somebody Spoofing?

On Jan. 3, 1933, a usually conservative newspaper in Berlin (Germany) ran a news item to the effect that a prominent U. S. automobile maker was experimenting with bodies and fenders of rubber. It seems that the only detail remaining to be solved is that of painting. We at automotive headquarters hang our heads in shame to learn that so important a news item should have been overlooked. But we are eager to make amends. Will some one give us the name and address of the manufacturer doing this work so that we may get the facts before our readers. Thank you.

Big Slice

Counting noses at the New York automobile show indicates that 48 per cent of the cars exhibited were equipped with wheels by Motor Wheel. This figure is quoted from a recent note sent in by the Motor Wheel Corp. The same memorandum also advises that 75 (count them) show cars had Centrifuse brake drums. How quickly a good idea spreads.

More Rope

We are glad to learn that the Williamsport Wire Rope Co. has been added to the list of people licensed to manufacture Preformed wire rope under the American Cable Co. patents. Preformed wire rope, as we understand it, is said to be better because the process eliminates the usual internal stresses.

In Black and Silver

Better Bearings by Bower is the title of a handy sized bookklet attractively clad in black and silver. It tells how the bearings are made and inspected. Its contents should be of interest to bearing users everywhere.—J. G.

MANUFACTURING MANAGEMENT METALLURGY

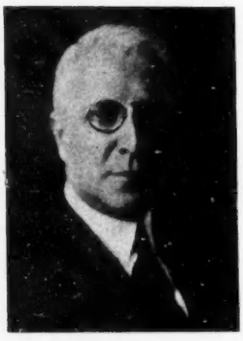
Willys and Miller Named Receivers to Effect Overland Reorganizations

Production of Cars and IHC Trucks Expected to Continue—Current Obligations Exceed $1,500,000—Assets More Than Cover Debts

By George W. Hibbert

TOLEDO—John N. Willys and L. A. Miller were named receivers for Willys-Overland by Federal Court on Wednesday of this week.

They are authorized to continue the operation of the plant. The bill of complaint was filed by the Monroe Auto Equipment Co., one of the Miniger group of companies. Mr. Willys left within a few hours for New York, where it is believed he plans to arrange some financial aid



John N. Willys

for the receivers to continue the present program of the company.

The Monroe Company claimed $17,105 for merchandise delivered in January and $1,191 on other account. In

L. A. Miller

the bill of complaint it was said that the current obligations of the company were more than $1,500,000.

(*Turn to page 212, please*)

Tire Price Warfare

After the recent flurry of price cutting, tire lists appear to have stabilized temporarily at a lower level at which most companies will lose more money.

We saw again open price warfare bursting from the smouldering of undercover, cut-rate competition and the practice of selling to mail-order houses at "discriminatory" prices. It's the same old story which, as usually written, has a tragic ending.

Plymouth Holds Fast Sales Pace

DETROIT—Retail deliveries of Plymouth sixes throughout the United States for the week ending Feb. 4—the latest available figures—are 281.4 per cent of retail deliveries for the week ending Feb. 6, 1932, the corresponding week. That same week, according to Plymouth Sales Manager Moock, factory shipments of Plymouth cars to Dodge, DeSoto and Chrysler dealers were 253.7 per cent of the croresponding week a year ago.

"In addition to these increases in retail deliveries and shipments," said Mr. Moock, "our Dodge, DeSoto and Chrysler dealers report a bank of unfilled orders for Plymouth cars on hand the week ending Feb. 4 which amounts to 207.5 per cent of their unfilled orders the corresponding week in 1932."

Ford Plants Producing 1000 Units Per Day

DETROIT—Daily Ford production is estimated to have reached the 1000 mark this week, with production at the Rouge plant at about 350 daily. Briggs and Murray are virtually back to normal schedules on Ford work.

NE

Studebaker Sales Far Ahead of December

SOUTH BEND—Retail deliveries of Studebaker passenger and commercial cars in January were 62 per cent more than December. This gain is considered encouraging by comparison with the seasonal 4 per cent drop under December that is the Studebaker average of the past ten years.

Each 10-day period of January showed an increase over the preceding 10 days. The third period was 75 per cent above the second; the second period was 6 per cent above the first, and the first period was 32 per cent above the last ten days of December. Present indications are that further gains will be recorded in February.

Hudson Body Plant Resumes Operations

DETROIT—Production is being resumed in the body plant of the Hudson Motor Co., employment having reached the 3000 mark, the level at which it stood when last week's strike was called. Activities are being resumed in other departments as rapidly as operations can be harmonized.

No Change in Ford Truck Chassis Prices

	Four-Cylinder Engine		
	112 in.	131½ in.	157 in.
Chassis	$320	$470	$500
Std. Panel	510	710	830
De Luxe Panel	530	745	None
Sedan delivery	520	None	None
Station wagon	590	None	None
Pick-up—closed cab	430	None	None
Std. Express	None	635	690
Platform	None	610	660
Stake	None	625	700
Hydraulic dump	None	750	None
Chassis with closed cab	405	555	585

Prices with eight-cylinder engine not available.

WS

N.S.P.A. Sets Chicago Parts Congress Dates

DETROIT—The National Parts Congress, which the National Standard Parts Assn. announced two weeks ago it would hold in the Stevens Hotel, Chicago, will take place Oct. 27 to Nov. 3. The annual convention of the association will be held on Friday and Saturday, Oct. 27-28, and will be followed by a five-day exhibition beginning Monday, Oct. 30, and continuing through Friday, Nov. 3.

The dates selected for the Congress coincide with the closing days of the Chicago "Century of Progress" exhibition, thus giving those in attendance an opportunity to see this event.

Factories Make Quick Re-adjustment to Michigan Eight-Day Bank Holiday

Wayne County Car Sales in Sharp Drop Following Suspension—Outside Funds Being Used to Meet Factory Payrolls

DETROIT—The industry has readjusted itself quickly to the abnormal situation created by Governor Comstock's dramatic declaration of a state-wide, eight-day bank holiday beginning on Tuesday of this week. Operations are being continued despite the handicaps imposed by the moratorium. At the present time, reports are current that there is a possibility that events will move rapidly enough so that the length of the holiday can be shortened.

Passenger car sales are being seriously affected in the state with dealers unable to make deliveries on orders in hand. Finance companies generally are cooperating with dealers where necessary in releasing cash funds instead of checks for dealer financing to permit continuation of business.

Wayne County registrations dropped from 111 Monday to 32 and 38 on Tuesday and Wednesday. Ford dealers are reported to have suffered particularly by the situation as Ford is now in a position to supply cars for delivery locally.

It is also reported that the tenseness of the labor situation has been relieved as agitation has been made exceedingly difficult by the suspension.

More than $20,000,000 is reported to have been shipped into Detroit to relieve the situation and the Detroit Clearing House has released $25,000,000 to cover emergency withdrawals up to five per cent of deposits. In addition, banks have been open for making change and to permit access to safe deposit boxes.

Immediate steps were taken by many corporations with the assistance of the banks to meet payrolls and other obligations. General Motors announced that it would pay in cash or provide facilities for cashing checks,

(*Turn to page 209, please*)

Industry's Stand on Highway Transport Endorsed by Transportation Committee

Motor Carrier Regulation Must Arise from Its Own Necessity and Cannot Be Invented for Benefit of the Railroads

PHILADELPHIA—Practically all of the industry's contentions on highway transportation find vigorous support in the report of the National Transportation Committee, which has been investigating the country's transportation problem at the request mainly of large investors in railroad securities. The committee consisted of Bernard M. Baruch, Clark Howell, Alexander Legge, Alfred E. Smith and the late Calvin Coolidge.

"Automotive transportation," the report says, "is an advance in the march of progress. It is here to stay. We cannot invent restrictions for the benefit of the railroads. We can only apply such regulation and assess such taxes as would be necessary if there were no railroads, and let the effect be what it may.

"On the question of whether public financing of roadbeds operates as a subsidy, there is a vast variety of circumstances. The automobile itself, its fuel, lubricants and operations are all heavily taxed. Does the total of these assessments bear its share of the general tax load and also sufficiently reimburse the public expenditure on the roads it uses? If it does, the circumstance that the charge is not comparable in amount to railroad costs of construction and maintenance of terminals and roadbeds is immaterial. The purpose is not to handicap automotive competition, but only to do justice."

Subsequently the report states "We think they (motor vehicles) should pay the carrying charges and cost of maintenance of highways they use and also their share of the general tax load." And "The committee . . . recognizes that no such intricacy of regulation as characterizes railroad supervision can ever be extended in this field, but is convinced that a broad measure of federal and uniform state

(*Turn to page 212, please*)

Car Sales "Turn the Corner" in January

Run ahead of year ago figures for first time since October, 1929

PHILADELPHIA—January registrations of new passenger cars ran a few thousand ahead of the 87,493 registered in the first month of last year's figures for the first ten states to report indicate. This is the first time passenger cars have been ahead of the same month in the preceding year since October, 1929.

On the basis of these early returns, Ford registrations were 47 per cent ahead of January, 1932, Chevrolet 16 per cent behind and Plymouth 175 per cent ahead. In the ten states for which data are available, General Motors got 48.5 per cent of the business, the various Chrysler divisions 21 per cent and Ford, including Lincoln, 19 per cent.

The preliminary figures indicate that the three leaders in the low-price field—Chevrolet, Ford and Plymouth—accounted for 60.5 per cent of total passenger car business in January which is the same percentage of total these three lines obtained a year ago.

Final figures are now available for December, with the exception of Iowa, and they indicate that for the first time in its history, the Chrysler Corp. group occupied first place. Total registrations of its various divisions in that month were 13,319 against 12,277 for General Motors and 12,174 for Ford including Lincoln.

$30 Drop on Fordor Only Major Change in List Prices on New Ford Eight Line

Production Expanding Steadily and Dealers Expect to Be Able to Make Volume Deliveries Shortly—Only 10,000 Old Models in Stock

DETROIT—Prices on the new Model 40 Ford eight parallel those on its predecessor, the Model 18, so closely that no upset in present price relationships in the lowest price field is expected. The most important change was in the price of the four-door sedan which was cut $30 to $560, but this reduction merely brings this price in line with prices quoted on this model by Ford's two largest competitors, Chevrolet and Plymouth, their prices being $565 and $545, as compared with $590 and $635 respectively in 1932.

The new Ford prices follow:

Standard	Old	Change	New
Roadster	$460	+$15	$475
3-Window Coupe	490	.....	490
5-Window Coupe	490	.....	490
Phaeton	495	.....	495
2-Door Sedan	500	.....	500
4-Door Sedan	590	—$30	560
Victoria	600	— 5	595
Cabriolet	610	— 25	585
DeLuxe			
Roadster	500	+ 10	510
3-Window Coupe	575	— 35	540
5-Window Coupe	575	— 35	540
2-Door Sedan	550	.....	550
4-Door Sedan	645	— 35	610
Phaeton	545	.....	545
Commercial—Four-cylinder			
112-in. Chassis			320
131-in. Chassis			470
157-in. Chassis			500

The following table shows where the above prices place the new Ford eight competitively in the lowest-price field:

	2-Door Sedan	4-Door Sedan	Roadster	Lowest Priced Coupe
Chevrolet	$515	$565	$485*	$495
Continental Beacon	395	....	355*	380
Continental Flyer	510	535	450*	490
Dodge Six	....	670	....	595*
Essex Six	515	565	425*	495
Ford Eight	500	560	475*	490
Plymouth	....	545	....	495*
Pontiac	635	695	585*	635
Rockne	585*	615	675	585
Willys 77	445	....	....	395
Willys 99	....	675	....	595*

*Lowest priced model in line.

Note—The Rockne roadster is a convertible model.

Production of the new Ford models is reported to be expanding steadily. On the announcement date, it is understood that 4,000 were available for display which took care of the major points. The remainder of the company's dealers expect to receive display models shortly and it is expected that all dealers will be in a position to make deliveries in the very near future. Stocks of the former V-8 model in dealers' hands are estimated at 10,000.

New Account for Sun

TOLEDO — Ryerson and Haynes, Inc., Jackson, Michigan, manufacturers of metal tire covers, have appointed Sun Advertising Co., of this city, to handle its advertising account. This company supplies tire covers for Chevrolet, Oldsmobile and Buick.

Casing Shipments in December Gain

NEW YORK—Shipments of pneumatic casings for the month of December, 1932, increased 6.3 per cent above November of that year, but were 34.6 per cent below December, 1931, according to the Rubber Manufacturers Association, Inc.

December, 1932, production of pneumatic casings decreased 13.9 per cent under November of that year, and 25 per cent below December, 1931.

Pneumatic casings in the hands of manufacturers Dec. 31, 1932, increased 2.5 per cent above Nov. 30, 1932 stocks, but were 1.7 per cent under Dec. 31, 1931.

The actual figures are as follows:

	Shipments	Production	Inventory
Dec., 1932	1,818,760	1,982,681	7,644,359
Nov., 1932	1,711,298	2,303,545	7,454,443
Dec., 1931	2,781,295	2,643,221	7,774,720

Auburn Granted Nine World's Speed Marks

PARIS—Speed marks set by the Auburn Twelve at Muroc, Cal., in December, have been accepted as world's class B records by the International Association of Recognized Automobile Clubs. The records granted are for 200, 500 and 1000 miles, 500, 1000 and 2000 km., and three, six and twelve hours. The fastest speed among the records is 113.38 m.p.h. for 500 miles. Class B is for cars having engines with piston displacements between 5000 and 8000 cc. (305-488 cu. in.).

Dominion Motors to Make Indians

TORONTO—As a direct result of the tariff and exchange situation, Canada is to have a motorcycle industry again after many years. Negotiations have concluded which will lead to the immediate manufacture of the Indian motorcycle in the plant of Dominion Motors Limited, Leaside, a suburb of Toronto. The latter is engaged in the manufacture of Durant, Frontenac, Rugby, Reo cars and trucks and the Canadian counterpart of the Continental automobile. The Indians assembled at Toronto will be labelled for Canadian and foreign sale.

The Dominion has not had the semblance of a motorcycle industry since before the Great War when an Indian factory was in operation at Toronto under the direction of Ed. Buffum, who later went to the main factory at Springfield, Mass.

Cord Corp. Declares

CHICAGO—Declaration of a dividend of 10 cents a share cash, was announced today by the Cord Corporation. The dividend is payable March 15, 1933, to stockholders of record at the close of business March 4, 1933.

Canadian Tariffs an Effective Bar

Imports of U. S. Cars Drop Sharply from 1931

OTTAWA—Canadian imports of U. S. passenger cars totaled 1104 in 1932 as compared with 7414 in 1931. The respective values were $794,034 and $5,534,769. Imports of U. S. trucks numbered 254 last year against 1207 in the preceding year. The respective values were $234,423 and $1,510,686.

Total exports of passenger automobiles in 1932 from Canada amounted to 9800 valued at $4,282,666 against 9282 valued at $4,011,921 in 1931. Truck exports last year amounted to 2734 with a value of $963,295 against 4531 with a value of $1,779,751 in 1931.

AC Has Universal Line in Four Types

FLINT, MICH.—The A.C. Spark Plug Co. has developed four spark plugs of a universal type which together will fit practically all engines now in service. These are known as the Type AA, for all engines with ⅞-in. spark-plug thread; the GG, for all engines with an 18-mm. spark-plug thread; the KK, for all engines with a 14-mm. spark-plug thread, and the FF, for all engines with a ½-in. pipe thread. The retail price of these plugs is the same as that of the regular AC line, viz., 60 cents.

The new line, it is understood, was introduced to meet the requirements of dealers who cannot well stock the full line of "heat range" AC plugs.

Brazil Buys from Waco

DETROIT, Feb. 9—Waco Aircraft Company has received an additional order for ten advanced trainers, powered with Wright 240-E Whirlwind engines, for the Brazilian Air Service. These airplanes, which will be shipped the latter part of this month, will make a total of 20 for this Government during this year, ten having been shipped on January 7th. A total of 69 airplanes for this Government have been shipped within a year's time, the first five Waco's having been shipped on March 19, 1932.

B.O.P. Has New All-Electric Radio Set

DETROIT—R. M. W. Shaw, sales manager for Olds Motors Works, has announced that a new B.O.P. all-electric superheterodyne radio set, designed and built especially for Buick-Olds-Pontiac Sales Co., is now available for Oldsmobile closed cars. As all Oldsmobile closed models are wired for radio it can be installed at slight cost. The dial control unit of the set is built so that it can be installed without injury to the instrument panel and can easily be removed if desired. Only seven tubes are required to do the work of nine ordinary tubes and an automatic volume control provides constant volume and eliminates fading while driving. No batteries are required except the regular car battery, an exclusive type of "B" power unit being located in the speaker housing, minimizing the tendency toward interference from the car's electrical system.

A. O. Smith Meeting

MILWAUKEE—A special meeting of the stockholders of A. C. Smith Corp. has been called for Feb. 27 in Eddyville, N. Y., to consider authorization of a $3,000,000 five-year 5½ per cent first mortgage issue which is to be used to retire 3,100,000 ten-year 6½ per cent first mortgage bonds maturing May 1, 1933.

White-S.P.A. Truck Sales Total $13,578,000 in 1932

CLEVELAND—The combined sales of White, Studebaker, Pierce-Arrow and Indiana trucks in the year 1932 amounted to $13,578,000, according to A. G. Bean, president of The White Motor Company, which is now merchandising those four lines of trucks. Mr. Bean stated that comparison of complete truck registrations now available for the year 1932 indicates that the above dollar volume exceeded that of any other lines of trucks except Ford and Chevrolet, placing White in third position in the truck industry as a result of the merger with Studebaker.

Big Willys Gain

TOLEDO, O.—Shipments of the 1933 Willys models in January exceeded shipments in the same month of last year by 87 per cent, according to John N. Willys, chairman of the Willys-Overland board.

One Hundred Years—

Great-grandson of the founder, is the fourth Whitney in a direct line to be president of the Dover Stamping & Manufacturing Co., founded 100 years ago

CAMBRIDGE, MASS. — One hundred years ago was laid the foundation on which the Dover Stamping and Manufacturing Co. has been built. In 1833 a staunch New Englander of high ideals and strong personality visualized the possibilities of making tinware by means of dies and tools instead of by hand. That was the beginning of an organization which for 100 years, through periods of prosperity and as many periods of depression, has grown into the company which today manufactures one of the largest, if not the largest line of automotive shop and filling station equipment of its kind which is sold throughout the United States.

The man whose foresight and solid business capabilities started this century-old business and guided it for fifty years, was Horace Whitney, who was its president from 1833 to 1883. Three generations of Whitneys have followed him as heads of the organization. Edward H. Whitney, his son, was president from 1883 to 1906; Horace E. Whitney, his grandson, was president from 1906 to 1932 and Carleton S. Whitney, his great-grandson, is president today. Another great-grandson, Allen F. Whitney, is treasurer. Louis S. Cleaves, who has been with the company for 22 years, is vice-president and general sales manager.

In days such as these the history of a business organization which has endured and grown through 100 years of plenty and of scarcity, which has remained for all that time in the hands of its founder and heirs in direct descent, offers an opportunity for study that should be both profitable and encouraging.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK—Business throughout the United States last week remained quiet and was subjected to the additional retarding influence of severe storms in several parts of the country. There were, however, exceptions to the general slowness here and there. Business activity and distribution of goods, according to the Federal Reserve Bank of New York, showed little change during the first half of January.

FREIGHT LOADINGS

Railway freight loadings during the week ended Feb. 4 totaled 483,192 cars, which marks an increase of 11,104 cars above those during the preceding week, but a decrease of 90,731 cars below those a year ago and a decrease of 235,861 cars below those two years ago.

BANKRUPTCIES

Commercial failures during January, according to R. G. Dun & Co., numbered 2,919, as against 2,469 during the preceding month and 3,458 a year ago. The liabilities involved in the January failures amounted to $79,100,602, as against $64,188,643 in December and $96,860,205 a year ago.

EMPLOYMENT

New York State factory employment during January declined 3 per cent., while total payrolls dropped 6 per cent. Both of these reductions were larger than the usual seasonal declines.

FARM EXPORTS

The combined volume exports of 44 farm commodities during December were lower than those in November and a year ago, although they were 16 per cent above the pre-war shipments.

CRUDE OIL OUTPUT

Average daily crude oil production for the week ended Feb. 4 amounted to 2,028,250 barrels, as against 2,008,700 barrels for the week before and 2,152,700 barrels for a year ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices during the week ended Feb. 11 and the week before stood at 55.3, as against 55.5 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City during the week ended Feb. 8 were 16 per cent below those during the corresponding period last year.

The stock market last week was not very spectacular, although a good tone was displayed. The level of activity was low, with the railway issues showing the most strength. General prices registered moderate net gains for the week.

FEDERAL RESERVE

The consolidated statement of the Federal Reserve banks for the week ended Feb. 8 showed a decrease of $15,000,000 in holdings of discounted bills and an increase of $20,000,000 in holdings of government securities, while holdings of bills bought in the open market remain unchanged. The reserve ratio on Feb. 8 was 65.3 per cent, as against 65.6 per cent a week earlier and 65.4 per cent two weeks earlier.

Employee Sales Plan Announced by Angell

MUSKEGON—Eleven hundred Continental Motors employees and their wives were entertained at a banquet here at which time W. F. Angell, president, outlined an employees' sales plan, whereby with each local sale resulting from an introduction by a Continental employee or his wife a commission of $10 on the Beacon model, $15 on the Flyer and $20 on the Ace, will be paid to the employee. A car purchased by an employee would also count toward a commission.

A civic banquet also was given in the Occidental hotel honoring Mr. Angell and the Continental Motors Corp. Mr. Angell, at that time, announced that all motors with the exception of airplane motors would be built here and that this program would be definite and continuous.

Parker Declares Dividend

DETROIT—Parker Rust Proof Co. has declared a dividend of 62½ cents a share on common stock, payable Feb. 20 to stock of record Feb. 10. A dividend of 50 cents was paid on Nov. 20.

President W. M. Cornelius said in part, "This distribution is well within our last three months' earnings. Volume of shipments for November and December were in excess of any previous like two months. Due to additional new customers and wider use of new processes, the company's 1933 prospects are satisfactory."

Ex-Cell-O Deficit

DETROIT—Ex-Cell-O Aircraft and Tool Corp., has reported net loss of $167,557 after depreciation, interest and other charges, for year ended Dec. 31, 1932, compared with a net loss of $259,109 for the previous year. Net profit before depreciation but after all other charges was $21,877 against a net loss of $67,602 in 1931 under the same conditions.

Bundy Names Agency

DETROIT — Holden, McKinney & Clark, Inc., Detroit advertising agency, announces the addition of two new accounts to its client list. Effective immediately, the advertising of the Bundy Tubing Company and American Injector Company, both prominent Detroit manufacturers, will be planned and placed by that agency.

Cooper on Two Boards

DETROIT—Ray Cooper, former head of the Aviation Section of the Detroit Board of Commerce, has been appointed to two directorships, according to an announcement by H. B. Grow, head of the two concerns. Mr. Cooper will serve as vice-president of both the Aviation and Industrial Corp., holding company with offices at 841 Penobscot Bldg., and of Graham, Grow & Co., aviation, finance and research corporation, with the same offices. Harry R. Graham is first vice-president of the two companies.

Mr. Cooper was manager for many years of the National Aircraft Show and as American representative of the International Federation of Aeronautics.

Goodyear Preferred Dividend Cut to 50c

Company Shows Net Loss of $850,394 for 1932

AKRON—Coincident with the release of the company's annual statement showing a net loss for the year ended Dec. 31, 1932, of $850,394 after charges, the Goodyear Tire & Rubber Co. announced that the dividend on the first preferred payable April 1, 1933, has been reduced to 50 cents. Last year, the company showed net income of $5,454,047 after charges.

During the last year earned surplus declined from $16,146,197 to $9,971,009. Capital surplus, on the other hand, increased from $21,516,182 to $21,998,790. The balance sheet shows current liabiliities of $99,219,435 against current liabilities of $7,654,225.

Marmon Loss

INDIANAPOLIS—A net loss of $234,524 after depreciation and other charges is reported by the Marmon Motor Car Co. for the quarter ended Nov. 30, 1932. The net loss for the nine months ending on that date was $720,219 against the net loss of $1,788,224 in the corresponding period of the previous fiscal year.

Graham Appoints Six

DETROIT—Appointment of six new factory representatives for the Graham-Paige Motors Corp. is announced by R. C. Graham, executive vice-president. The new representatives and their headquarters points follow: J. F. Golden, New York City; A. F. Soul, Charlotte, N. C.; Harvey Corn, Dallas, Texas; S. Gordon Mattheus, Buffalo, N. Y.; Frank Schilling, Cincinnati; R. J. Nolan, Chicago.

Foote-Burt Nets $75,985

CLEVELAND — A net profit of $75,985 after taxes, charges and depreciation, is reported by the Foote-Burt Co., for the year ending December 31, 1932. This compares with net loss of $189,879 in 1931. Current assets at the end of last year amounted to $589,920 and were more than 14 times current liabilities.

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Readjustment to Bank Holiday

(*Continued from page 205*)

while Chrysler opened a cash disbursing office for the purpose. Outside banks carrying deposits for some companies are reported to have authorized their correspondent banks in Detroit to cash checks drawn by these companies and charge them to their accounts.

Revisions in national and Michigan banking laws are a possible result of the crisis here, changes in the law being urged that would give banks more breathing time under conditions such as developed here and a week ago in New Orleans.

According to the Governor, the crisis was precipitated by the affairs of the Union Guardian Trust Co., which is desirous of getting out of the banking business, leaving that phase of its operations to allied organizations. The company already had borrowed $15,000,000 from the R.F.C. and has asked for more. Inability to provide security for the new loan satisfactory to the R.F.C., the Governor's statement indicates, was responsible for the proclamation. He said the moratorium was necessary to protect the smaller depositors inasmuch as a number of the larger depositors had prior information.

A dramatic incident of the week was Governor Comstock's admission that he had misunderstood the facts when he charged earlier that the Ford company refused to subordinate its claim for $7,500,000 on deposit although General Motors and Chrysler has agreed to do so. In his retraction, that G.M. and Chrysler were not depositors, that there was no agreement, the Governor said that it was suggested by the two companies that "Ford Motor Company should put up a substantial part of the necessary funds to take care of the loss. Ford Motor Company took the position that it had already put approximately $20,000,000 in the Union Guardian business and they could make no further investment."

The decison to declare a banking holiday was reached after three days of conference in which Treasury Under-Secretary Ballantine and Commerce Secretary Chapin participated and the proclamation was issued at the request of the Michigan State Bankers Association and of the Detroit Clearing House. The moratorium freezes temporarily $1,500,000,000 belonging to 900,000 depositors.

Joint Sales Drive Discussed

NEW YORK—A cooperative sales promotion effort by the industry when the buying season opens up this spring, was considered here this week at a meeting of the sales managers' committee of the National Automobile Chamber of Commerce.

Reese Appointed Continental P.A.

DETROIT—L. C. Curl, assistant secretary of Continental Motors Corp. and director of purchases for all Continental subsidiaries, has announced the appointment of John C. Reese as purchasing agent of Continental Motors Corp. and its subsidiaries. Mr. Reese, who has been purchasing agent for the automobile division of the Corporation since its formation, was formerly with the Durant Motor Corp. in the same capacity.

Announcement was also made of the appointment of George E. Winters, traffic manager of Continental Motors Corp., to the same position for all subsidiaries. Mr. Winters has been with Continental for the past 12 years.

Twin Coach Report

AKRON, O.—The Twin Coach Co. of Kent financial report for 1932 showed a net loss of $48,968. Dollar sales of the company for 1932 were only 46 per cent of the 1931 volume.

Muncie Deficit Smaller

NEW YORK—Muncie Gear Co. reports a net loss of $81,365 for the year ended Dec.31,1932,against a loss of $93,038 in the previous year. Current assets on that date were $104,218 against current liabilities of $76,579.

Modine Reports Loss

CHICAGO—Modine Mfg. Co. reports net loss after charges of $165,652 for the year ending Dec. 31, 1932, against a net profit in the preceding year of $30,963. Current assets at the year end were $929,546 against current liabilities of $109,188.

Ross Earns $123,680

CHICAGO—Net profit of $123,680 after depreciation, taxes, etc., is reported by the Ross Gear & Tool Co. for the year ended Dec. 31, 1932. This compares with $246,422 in the preceding year.

Fisk Sale Authorized

BOSTON—Foreclosure sales of the Fisk Rubber Co., with the exception of $7,000,000 in cash, bonds and certificates of deposits which will be turned over to the creditors, has been authorized by the Federal Court. Receiver John B. Pierce was appointed special master to handle the sale.

Gemmer Improves Showing

DETROIT—Gemmer Mfg. Co. reports net loss of $178,685, including a non-recurring charge of $41,092, for the year ended Dec. 31, 1932. This compares with a net loss of $230,103 in 1931.

Defer Action to Up Steel Prices

Michigan Bank Crisis Upsets Plan to Lift Prices to Higher Level

NEW YORK—Up to the time when news of the Michigan bank moratorium eclipsed all other developments in the steel market, there had been a well-defined effort on the part of producers to "stabilize" the market's price structure. It was intended to tackle sheet and wire prices first, these two descriptions of finished steel having yielded more ground since Jan. 2 than any others. Early this week predictions that there would be some advances in sheet prices before March 1 were freely made, but Governor Comstock's proclamation brought so many, for the time being, more pressing problems into the foreground that the "stabilization" movement was, at least temporarily, "shelved." As repeatedly in the past, intimations of impending price advances to automotive consumers were not so much intended as an out-and-out upward revision of prices as they were as notice to buyers that producers would hereafter more energetically resist any further inroads on going prices. It was said that black sheets which automotive consumers had been buying at 1.90c, Pittsburgh, would be "stabilized" on a 2c basis and that an attempt would be made to bring the price of cold rolled 20 gauge, which had dipped to as low as 2.25c, Pittsburgh, back to 2.50c. As matters stand now, all of these plans represent nothing more than the "views" of sellers and in the present market atmosphere a real upward movement of prices seems highly problematical. Sheet rollers supplying Ford body and parts makers complain that Ford releases are coming through very slowly.

Pig Iron—A fair volume of releases from automotive foundries is coming through. Prices are unchanged.

Aluminum—Quiet and unchanged.

Copper—While improvement in domestic demand is reported in some quarters, the market as a whole remains very little altered, spot and first quarter metal being freely available at 5 cents, delivered Connecticut Valley.

Tin—In spite of sharp declines in London on Monday when the American market was closed, the firm position of Sterling served to hold up prices here, the opening price on Tuesday for spot Straits being 23.60 cents.

Lead—Dull and unchanged.

Zinc—Dormant.

Michigan Gains 9%

DETROIT—Registrations of new motor vehicles in January ran 9 per cent ahead of last year, the respective totals being 5033 and 4613. The comparative figures on passenger cars were 4632 and 4137 and on trucks 401 and 476, for 1933 and 1932 respectively.

Ontario Gets Ready to Set Truck Rates

Motor Carriers Submit Schedules to Province

TORONTO—Following cooperative consideration by various organizations, a suggested schedule of charges for commercial public vehicle shipments within the Province of Ontario has been submitted to the Ontario Government as the basis for a standard tariff of truck tolls to be fixed by the Province. The interested associations have intimated that they will support the Government in the enforcement of tariff and other regulations, these bodies including the Automotive Transport Association of Ontario, the Canadian Industrial Traffic League, Canadian Manufacturers Association and the Boards of Trade at Toronto, Hamilton and Ottawa.

The suggested schedule shows maximum rates for truck shipments in five classifications up to 520 miles with a minimum charge of 75 cents for one package for any distance up to 170 miles. In some instances the first class rate is higher than the corresponding railway freight tariff but there are many lower ratings in other classes. For distances from 95 to 120 miles, for instance, the first class rail rate is 58 cents per 100 lbs., while the first class truck rate is 62 cents. Other truck ratings for second to fifth class scale down from 53 to 30 cents per 100 lbs., the minimum charge being 75 cents. There are 23 "brackets" for mileages, ranging from 15 miles to the maximum 520 miles.

The greater the value of the material shipped, the higher will be the rate. Heavy material requiring little space will go more cheaply than lighter packages occupying considerable room.

The filing of special truck rates for specific commodities or unusual services is made compulsory and any reductions from standard tariffs must be given to the Ontario Department of Highways at least three days before they are actually effective. A month's notice is required for any truck rate increase. Provision is made for a distinct group of tariffs where the truck routes are in direct competition with the railways where conditions may necessitate frequent revision.

It is expected that the Ontario schedule will form the basis for truck tariffs in other Provinces of the Dominion so that uniformity will be obtained throughout the country.

Ornberg Goes Home

Ivan Ornberg, for the last 18 years assistant chief engineer of the Hupp Motor Car Corp., has resigned to accept a position in his native country, Sweden, with the Swedish automobile manufacturer, A. B. Volvo, Gothenburg.

To "Get Their Man" on Motorcycles

TORONTO — Tradition has always associated the horse with the Royal Canadian Mounted Police, the historic, scarlet-coated constabulary which has figured in countless exploits. But the horse is becoming passé, largely because of modern traffic trends.

It has been decided to provide many members of the R.C.M.P. with motorcycles—and they are British mounts at that. An order was recently placed for 40 motorcycles for the Manitoba Division alone at a cost of more than $8,000.

Budd and Fleetwings Join in Shotweld Work

PHILADELPHIA—The Edward G. Budd Mfg. Co. and Fleetwings, Inc., Garden City, N. Y., has completed negotiations by which the further development of the "shotweld" system in aircraft construction will be carried on jointly. The rights to use the process covered by applications and patents are cross-licensed one to the other, together with the right to sublicense the system in the aircraft industry.

Mr. B. H. Russell, manager of the Stainless Steel Division of the Edward G. Budd Mfg. Co., explained that the laboratory work which was initiated under Colonel Ragsdale's leadership a number of years ago, has been very capably supplemented by the investigations of Carl de Ganahl and his associates in the Fleetwings Corp.

Rusco Research Lab Gets New Equipment

MIDDLETOWN, CONN.—A complete remodeling and reequipment of its research laboratory and additional expenditures of more than $100,000 per year on research work on current and new products are announced by the Russell Manufacturing Co.

Among the new equipment installed in the Rusco research laboratory are an inertia machine to test brake linings, including a blower to create air streams simulating different automobile speeds and clutch facing machine.

"Cured-In" Tire Valves

AKRON—A "Cured-in" valve in which the valve base is vulcanized to the valve pad, and this in turn to the tube, making the valve pad and tube an integral unit and leaks at this point impossible, is announced by the B. F. Goodrich Rubber Company, Akron, Ohio.

January Production Close to Last Year

N.A.C.C. Members Five Per Cent Ahead of '32

NEW YORK—For the first time since August, 1931, production of N.A.C.C. members in January exceeded that of the corresponding month of the preceding year. The Chamber's preliminary estimate places the total for the month at 115,915, which is five per cent ahead of January, 1932, and 38 per cent above December.

In view of the disruption in Ford production occasioned by labor troubles at the Briggs plant, what the industry's total was in January is problematical. It is estimated, however, that January Ford production was between 5,000 and 10,000 units, which puts the industry's total at between 121,000 and 126,000 against 123,075 a year ago.

New Fuel Knock Test O.K.'d by A.S.T.M. Group

At a recent meeting of A.S.T.M. Committee D-2 on Petroleum Products and Lubricants, held in Washington, D. C., unanimous approval was given, subject to confirmation by letter ballot, to the C.F.R. Motor Method, determining the knock characteristics of motor fuels. It involves use of the C.F.R. engine, manufactured by Waukesha Motor Company, Waukesha, Wis. It is expected that this method will become an A.S.T.M. tentative standard prior to April 1, 1933, after which time it will be generally employed in place of the method described in Appendix II of the 1932 D-2 Report. Most motor fuels are given a somewhat lower octane number by the new method than that obtained by the old one, the difference being due largely to operating at a higher engine speed.

Rubber Consumption Off Only Slightly

LONDON—World consumption of rubber shrank slightly in 1932 to 666,000 tons against 677,000 tons in 1931, according to estimates made by S. Figgis & Co. Production totalled about 707,000 tons, indicating an increase in stocks of 41,000 tons. Output was more nearly in line with consumption last year than in 1931, as the excess output in that year amounted to about 115,000 tons.

Canadian Exports Slump

November exports of motor vehicles and parts from Canada declined 40 per cent from the October level, according to a report of the Commerce Department's automotive division.

Chevrolet Delivers 39,701 in January

A Year Ago Sales Were 35,199 in Same Month

DETROIT—Chevrolet dealers report retail deliveries of 16,826 new cars and trucks in the last ten days of January, bringing the total of retail sales for the month to 39,701 units, compared with 35,199 in January of last year, according to a statement by H. J. Klingler, vice-president and general sales manager of the Chevrolet Motor Co.

January sales were the largest since June of last year and the last ten-day sales were larger than any reporting period since June 20, just prior to the establishment of a federal excise tax, and compare with 13,438 sales in the last ten days of January, 1932, a gain of 25.2 per cent.

In the first ten days of January dealers delivered 10,162 units, 12,713 in the second ten days and 16,826 in the last period, the increase reflecting the availability of cars for delivery, the statement said.

To date over 50,000 of the new 1933 models have been placed in owners' hands since announcement of the new line.

Michigan Tax Plan Hard on Industry

DETROIT—More than $8,000,000 would be added to retail automotive prices under the new tax plan proposed for Michigan by Governor Comstock. Under the plan, there would be a three per cent level and a 0.3 per cent tax on manufacturers' sales. The latter tax would pyramid on itself, as sales not only of vehicle manufacturers but also of their suppliers would be taxed. If the plan were adopted, it is estimated that the Federal excise levy would bring the total tax on automotive sales in Michigan to 10 per cent.

Peed Reports 193 Per Cent DeSoto Sales Gain

DETROIT—Roy G. Peed, general sales manager, DeSoto Motor Corp., has reported that retail deliveries by DeSoto dealers for January totaled 4215 cars as compared with 1440 for January of last year, an increase of 193 per cent, and with January, 1931, total of 1128, a gain of 274 per cent. These figures include Plymouth sales by DeSoto dealers.

DeSoto sales for January this year totaled 1280 units as compared with 712 for January of last year, an increase of 80 per cent, while Plymouth sales by DeSoto dealers mounted to 2935 as compared with 728 for January of last year, a gain of 303 per cent.

DeSoto sales for the month also showed a 46 per cent gain over January, 1931, and Plymouth sales by DeSoto dealers showed a 1069 per cent gain for that period.

Mr. Peed also reported that unfilled orders in the hands of dealers to date in February were thirty per cent ahead of the total at this time last year.

New G. M. Taxicab

Ray Day Appoints Sun

DETROIT — Ray Day Piston Corp. has appointed Sun Advertising Company, Toledo, to handle its advertising account, effective Feb. 1.

CALENDAR OF COMING EVENTS

FOREIGN SHOWS

Berlin International .....Feb. 12-22

SHOWS

Kansas City Automobile Show.Feb. 11-18

Toledo, Ohio, Automobile Show.Feb. 11-18

Camden, N. J., Automobile Show Feb. 15-18

MEETINGS

Rapid City, S. D., Automobile Show Feb. 14-18

Peoria, Ill., Automobile Show..Feb. 15-19

Wichita, Kans., Automobile Show Feb. 21-24

Holyoke, Mass., Automobile Show .....Feb. 22-25

Evansville, Ind., Automobile Show Feb. 24-26

Albany, N. Y., Automobile Show Feb. 25-Mar. 4

Seattle, Wash., Automobile Show Feb. 26-Mar. 4

Des Moines, Iowa, Automobile Show .....Feb. 27-Mar. 4

Am. Society Testing Materials, New York .....Mar. 8

U. S. Chamber of Commerce Meeting, Washington, D. C.....May 2-5

American Society for Testing Materials, Chicago .....June 26-30

National Metal Congress, Detroit Oct. 2-6

New G.M. Taxicab a Six at $1,295

PONTIAC, MICH.——A new taxicab at the low price of $1,295 list, has been announced by the General Motors Truck Company. The new General Cab model 0-14 is the first to carry Fisher no-draft ventilation, built into the rear quarter windows.

The chassis is specially designed for taxicab service, and carries the latest type G.M.C. No. 221 six cylinder valve-in-head engine, with downdraft carburetion, etc., developing 69 hp. at 2800 rpm.

Hydraulic service brakes, X-member frame, quick removable steel backed main bearings, 1000 lb. less weight than in the General 0-12 cab, are further mechanical features. Glass, including the partition, is of the nonshatterable type. The upper half of a two-piece windshield opens outward.

Rockne Adds 128 Dealers

DETROIT, Feb. 13—One hundred and twenty-eight new dealers have taken on the Rockne line since the new 1933 models were announced to the trade last December, according to an announcement by F. L. Wiethoff, sales manager of Rockne Motor Corp.

There are now more than 2200 dealers handling the Rockne Six, including Canadian and foreign outlets.

Aage Winckler

MILWAUKEE — Aage Winckler, who died here last week at the age of 51, became chief engineer of the automobile division of the J. I. Case Threshing Machine Co. upon his arrival in America from Copenhagen in 1909. He withdrew in 1916 to form the Winckler Engineering Co. at Milwaukee, specializing in automotive design. He had numerous inventions to his credit including an oil injection unit for internal combustion engines. Mr. Winckler was a member of the S.A.E.

Receivers Named to Reorganize Overland

(*Continued from page 204*)

outstanding $2,000,000 on its first mortgage bonds of which $1,000,000 was in default on Sept. 1 last.

There is outstanding $12,776,300 of preferred stock with some accrued back dividends, and 3,000,000 shares of $5 par common stock.

The bill sets forth that assets of the company at fair value will be greatly in excess of indebtedness. It is understood that cash of the company was slightly under $200,000 at the beginning of the month, that most purchases lately had been made with 90-day trade acceptances to be taken up when returns from new car sales came in, and that about $800,000 of obligations to vendors had been extended from July and August for one year. Receivables are believed to be in excess of $2,000,000, inventory more than $5,000,000 and the plant is carried at a depreciated value of $31,000,000. Large amounts of surplus have been used to write off plant, tools, and extraordinary items in the last three years.

The receivership is not expected to interfere with operation of subsidiaries and contract for the manufacture of half-ton trucks for International Harvester Co. will be carried on.

Following the appointment as receivers, Mr. Willys and Mr. Miller issued a statement in which they said the action had been taken with assent of the directors of the company "to permit of a reorganization of the capital structure of the company, to preserve working capital and to maintain employment as far as possible."

"In spite of the fact that working capital of the company was greatly depleted during the tremendous shrinkage of automobile sales in 1931 and 1932 a complete new line of cars was developed with the help of credit extended by vendors during the last few months," declared receivers.

"Had it not been for the continued delay in improvement of general business it would have been possible to work out the reorganization without resorting to this protective measure. It is hoped, however, that this decisive move will enable the company to carry through its production program.

"We have every reason to believe that the production of passenger cars and of trucks for the International Harvester Company will be continued.

The court did not name a special master but appointed Rathburn Fuller, director of the company, and Forrest Jeffries, trust office of the First National Bank, Toledo, as counsel for the receivers.

The company now has nearly 8000 workers employed here and has contributed in recent weeks to recall of men to give Toledo its largest employment since last March.

Production was 5400 cars in January and schedule called for 6000 cars in February and 7000 units in March.

The receivers were each required to give $100,000 bond. By the court order they are given authority to carry on complete operation, to borrow money for current needs, to pay all expenses and taxes and no action in bankruptcy may be started without express authority from the court.

The receivership action was taken here after an all day conference of leaders in the industry and bankers. Sale of 54,000 shares of the common stock Wednesday, sending it to a low of 50 cents a share and drop of more than five points in preferred to a level of 12 was taken as a signal that some dramatic move was to be made.

The company had received practically no bank aid in the last two years.

Reception of the 1933 cars at shows has been very good, but movement was not rapid enough to build up cash of the company.

Yellow Deficit Is $3,787,051

PONTIAC, MICH.—"Net sales of Yellow Truck & Coach Manufacturing Company for the year ended Dec. 31, 1932, were $16,437,874," Paul W. Seiler, president, announced today. "Net loss after provision for depreciation was $3,787,051. In the year 1931 the company reported a net loss of $2,762,335."

Maryland Car Sales Hold January Gains

BALTIMORE — Registrations of new passenger cars in Maryland in the first ten days of February amounted to 516 as compared with 469 in the same period last year, thus continuing the gains registered in January. New truck registrations for the same ten-day periods were 66 and 71 respectively.

Goodrich Reduces Loss

AKRON—Net loss of the B. F. Goodrich Co. for the year ended Dec. 31, 1932, was $6,582,140 against $8,806,567 in the preceding year. Current assets at the year-end amounted to $49,027,155 as compared with current liabilities of $5,331,857.

Net sales of the company declined from $115,165,147 in 1931 to $74,501,803 last year.

Raybestos Statement

NEW YORK—A preliminary statement of Raybestos-Manhattan Inc. puts its net loss for 1932, after taxes, depreciation, etc., at $457,167 as compared with a profit in 1931 of $553,992 before inventory adjustments. The balance sheet shows current assets of $6,277,670 equivalent to 20 times current liabilities.

Indorse Industry on Highway Transport

(*Continued from page 205*)

control can and should be applied."

As to the railroads, complaints that they are shackled with regulation while their competitors are not, etc., the Committee says, "To the extent that this is true, it is unfair. But it must be equally clear that notwithstanding the deep public interest in our railroads, the government cannot stand in the way of progress. Certain regulation of competitive methods is necessary. . . . But regulation of them must arise from its own necessity and burdens upon them must derive from justice. The government cannot for the sake of the railroads invent and apply to their competitors either regulation or burden on the theory upon which horses are handicapped in a race."

Rails Remiss

"The early transport pioneers did not go to Washington to have their ferries and steamboats protected against rails. They developed the rail service and became controlling figures in the new field. We think it is quite clear that the railroads have been distinctly remiss in not getting the most out of the new methods. It seems to us that the truck, in local and terminal service, motor drawn equipment on rails and highways in many cases, and the airplane, where rapid transit is required, afford a way to a beneficent transport revolution, that the railroads themselves owed a duty to the public to have led, and that the quicker they do so now, the better it will be for all concerned. After they have taken this logical step, we wonder whether they will be so eager to restrict these other forms of transportation as they are now."

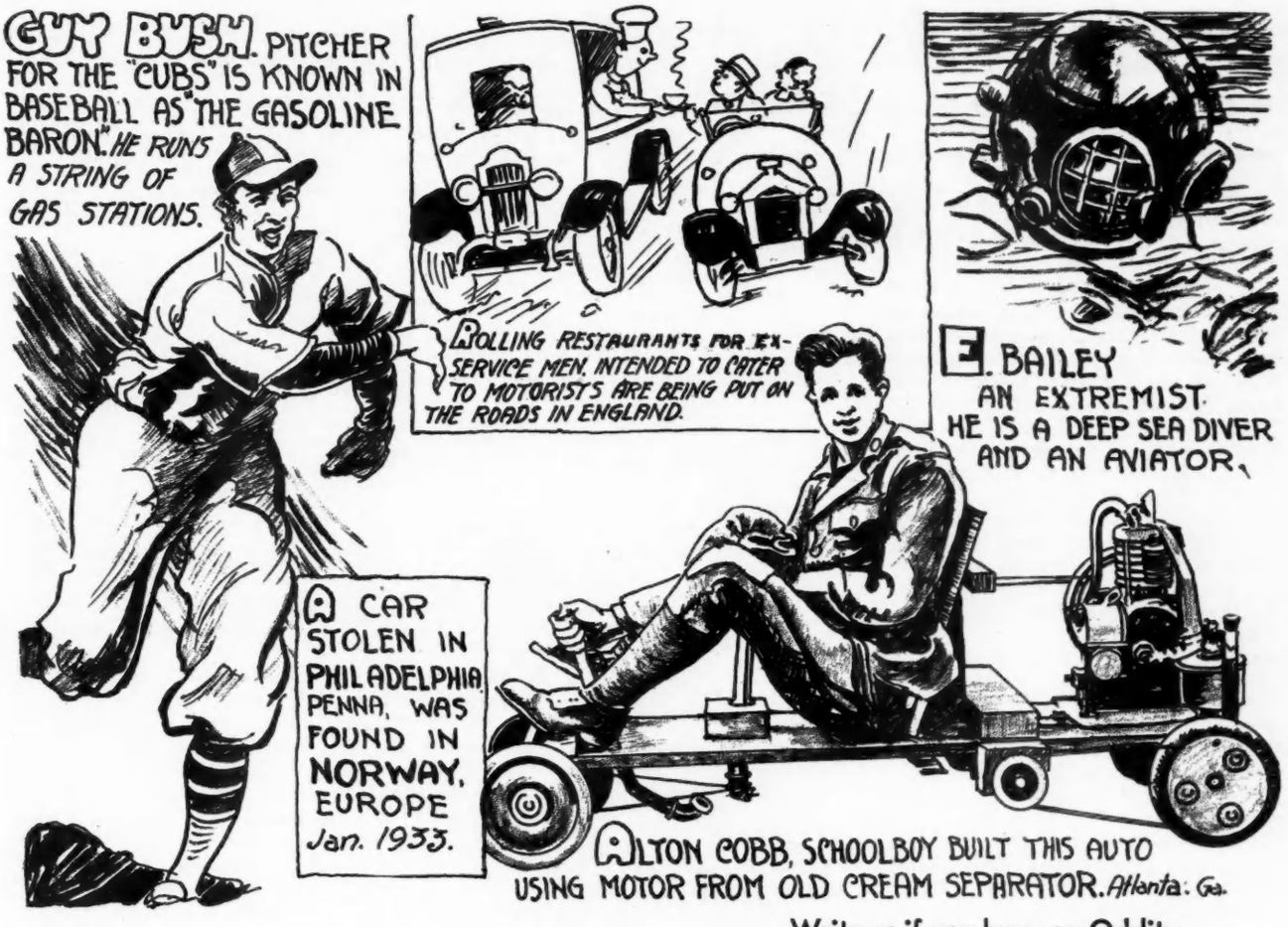
In a supplemental report, Ex-Governor Alfred E. Smith says, "I believe that such regulation (of highway transportation) should, for the present, be for the purpose of insuring responsibility, and fixing the physical standards for vehicles and for similar purposes, rather than for fixing of rates."

These excerpts are for the most part in such close accord with the position which the industry has maintained for years, that the Committee's report amounts almost to an endorsement.

Lycoming Has Deficit

WILLIAMSPORT, PA.—A deficit of $456,612 is reported by the Lycoming Mfg. Co. for the year ended Nov. 30, 1932, against a net profit of $1,239,815 in the preceding fiscal year, after depreciation and taxes. Preferred dividends paid during the year amounted to $74,615 and adjustment in tool amortization of $66,331, bringing the decrease in surplus for the year to $597,058.

Automotive Oddities—By Pete Keenan


GUY BUSH. PITCHER FOR THE "CUBS" IS KNOWN IN BASEBALL AS "THE GASOLINE BARON." HE RUNS A STRING OF GAS STATIONS.
ROLLING RESTAURANTS FOR EX-SERVICE MEN, INTENDED TO CATER TO MOTORISTS ARE BEING PUT ON THE ROADS IN ENGLAND.
E. BAILEY AN EXTREMIST. HE IS A DEEP SEA DIVER AND AN AVIATOR.
A CAR STOLEN IN PHILADELPHIA, PENNA, WAS FOUND IN NORWAY, EUROPE Jan. 1933.
ALTON COBB, SCHOOLBOY BUILT THIS AUTO USING MOTOR FROM OLD CREAM SEPARATOR. Atlanta, Ga.

Write us if you know an Oddity

Inflation No Royal Road to Reflation

(Continued from page 196)

eigners less in gold so our exports would increase. Then foreign nations would act to prevent the dumping of our goods in their markets, and would tighten exchange restrictions to reduce the flow of their gold to these shores.

The tendency would be for our price levels to adjust themselves ultimately to the new gold content of our money, but the process would probably be a slow one, and for a long time we should find ourselves receiving the same old incomes, owing the same debts, and doing business at about the same prices. The reason for the probable tardiness of general price advances is that except for security transactions the increase of prices as measured in new thin dollars would result only from the fact that our exported staples would keep their world gold value and so have increased dollar value. Gradually other prices would adjust themselves upward into relationship with export staple prices.

It is erroneous to suppose that a decrease in the gold content of the dollar would immediately lift general price levels correspondingly. This country did actually decrease the gold content of the dollar by a little over six per cent at the end of June, 1834. The average of all wholesale prices in the six month following the change was about half a per cent lower than in the six months preceding it. England abandoned the gold standard in September of 1931. Since then the gold value of the pound has been decreased by about 31 per cent, and prices of commodities in England are at the levels of 1931. The gold value of Canadian money has been decreased by about 13 per cent and commodity prices have actually declined. Many similar examples could be cited.

There is no royal road to reflation, but there is a path to recovery if we have courage to follow it. The goal is restoration of confidence so that increasingly active business may cause credit expansion. The most necessary steps are listed in the platform of the new administration. These include drastic reduction of governmental expenditures, a balanced budget, a sound currency preserved at all hazards, reciprocal tariff agreements, together with measures to restore international trade and facilitate exchange. If reasonably rapid progress can be made in fulfilling these covenants, and negotiating a war debt settlement, we may be assured that restoration of confidence will result.

NEW DEVELOPMENTS
Automotive Parts, Accessories and Production Tools

Olsen-De Shazer Strain Gage

A new strain gage, developed by G. A. De Shazer, has been placed on the market by the Tinius Olsen Testing Machine Company of Philadelphia, as the Olsen-De Shazer strain gage. One of its features is that the gage points in their relative motion always remain parallel with each other. The motion of the movable point, relative to the block, is transmitted through levers and a plate fulcrum system to the dial indicator. The gage points have a 30-deg. angle and are inserted into holes drilled in the test-piece, which practice is said to assure the highest degree of accuracy on repetition measurements for stress or deformation.

Complete enclosure of the levers, fulcrum, and working parts of the dial indicator is said to add further to the accuracy of the instrument.

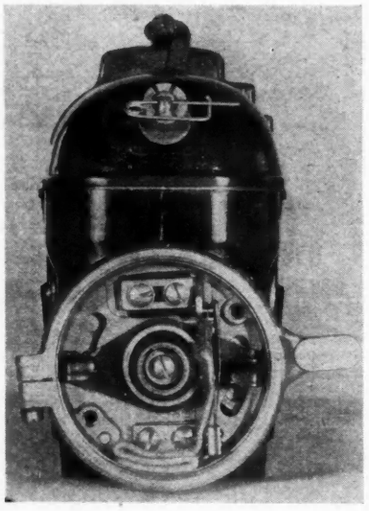
The frame is of stainless material and therefore rust-proof. The main lever system, to which the parallel motion of the gage points is due, is not affected by ordinary temperature changes, so that the gage may be used in direct sunlight without affecting the readings.

This strain gage is made in both a 2-in. and a 10-in. size. The 2-in. gage has a total motion of 0.04 in., and when used on steel with a modulus of elasticity of 30,000,000 lb. p. sq. in., each scale division corresponds to 1000 lb. p. sq. in. One of the points of this gage is movable and can be so

located as to convert the instrument into a 1-in. gage. The 10-in. gage has a range between the points of 0.05 in. and gives strain readings of 500 lb. p. sq. in. per scale division, on the basis of a modulus of elasticity of 30,000,000 lb. p. sq. in. The 2-in. gage weighs 1 lb. and the 10-in. 2½ lb. approximately. Both gages can be furnished with either a horizontal or a vertical dial indicator.

Bendix Magneto

A new magneto, known as the Bendix, has been launched on the market by the Scintilla Magneto Co., Inc., Sidney, N. Y. It is recommended by the makers for use on automotive, agricultural, marine, industrial and stationary engines. It is said to have been in limited production for about a year, so that it is not untried. The



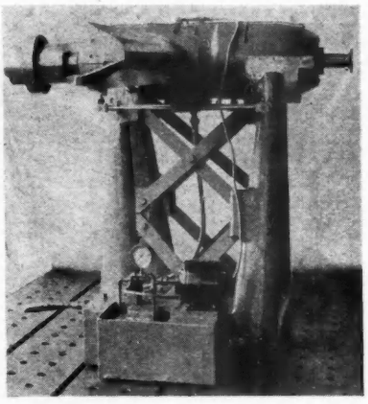
magneto is completely enclosed and is dust-proof and water-proof. The spark advance, it is stated, can be readily set to meet the requirements of any engine.

The magneto is available with the Bendix impulse coupling with either automatic or manual control, and adjustable to a wide range of lag angles and throw-out speeds. Flexible-drive couplings are also available.

Bendix magnetos are made for engines of all sizes, with from one to six cylinders. They conform to S.A.E. base mounting dimensions. Drive shafts have the standard S.A.E. taper with keyway for No. 3 Woodruff key. Shaft center height is 1.772 in. Bases have holes spaced 50 mm. lengthwise and crosswise, for ⅜-16 mounting screws, and are provided with reenforcement plates. Distributor gears are bronze on steel. The weight of the machine is about 14½ lbs.

Aviation Transmission Dynamometer

In testing airplane engines and propellers it is sometimes desirable to use a dynamometer of the transmission type, instead of the usual absorption dynamometer. A transmission dynamometer suitable for this



purpose has been developed by the Farrel-Birmingham Company, Inc., of Buffalo, N. Y. It has a capacity of 1000 hp. at 1000 rpm., and can be used for higher powers at higher speeds.

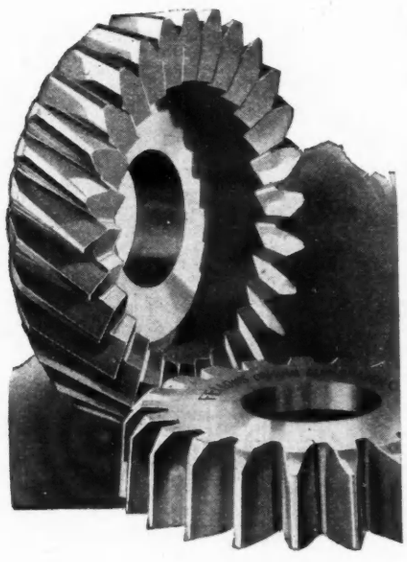
The principle on which the dynamometer is based is that of the torque reaction on the housing of a geared transmission, which torque is measured. There are two pairs of gears in the housing, each consisting of an externally toothed pinion and an internally toothed gear. Driving and driven shafts are coaxial, and in addition, there is an intermediate shaft which is offset from the axis of the other two shafts. It is the bearing pressure of this shaft which tends to cause the housing to turn around the axis of the main shafts, and the torque reaction on the housing is readily measured by means of the torque arm shown in the illustration.

The slip stream from the propeller serves to cool the engine, and for this reason the diameter of the dynamometer housing has to be kept as small as practicable. The limit set for this size of dynamometer was 17 in. diameter. This relatively small diameter for the high power being transmitted necessitates small gears, which results in high tooth pressures.

The adoption of internal and external gears permits high tooth pressures, due to the relatively large number of teeth in engagement, but notwithstanding this advantage, special materials have been found necessary. The pinions are made of a chrome-nickel, case-hardened steel and the wheels of Nitralloy. Precision deep-groove, double-row ball bearings are used throughout, and oil is circulated through the case by means of a pump.

. . . . Just suppose your GEAR INSPECTOR took over your Gear Shaper Cutter *Buying!*

YES! BUT REMEMBER WE ARE BUYING CUTTERS AT A PRICE THAT IS SAVING US MONEY!
PURCHASING AGENT
YOU MAY THINK YOU ARE. BUT I WANT TO TELL YOU THAT OUR GEAR REJECTIONS SHOW A LARGE INCREASE.... ALSO OUR INSPECTION COSTS ARE UP.
WISH YOU WOULD GIVE THAT "FELLOWS" MAN AN ORDER FOR ORIGINAL FELLOWS CUTTERS. BELIEVE THEY ARE WORTH THE DIFFERENCE IN PRICE.
WHY! JUST FINE! THOSE ORIGINAL FELLOWS CUTTERS HAVE CUT OUR REJECTIONS TO THE VANISHING POINT. WE'LL SPECIFY FELLOWS IN THE FUTURE.



THE prime object in any modern gear plant is to produce ***good*** gears, which experience has shown requires the best obtainable equipment and tools. In times like these, when every tool purchase is exactingly scrutinized, the "will-o'-the-wisp" idea of "***just as good***" may seem more real than ever. But it is wise to consider that a run of unacceptable gears might entirely wipe out any possible saving you might make by putting ***price*** before ***quality***.

ORIGINAL FELLOWS Gear Shaper Cutters are not made to "sell at a price," but rather to produce satisfactory gears. When an automotive manufacturer's gear department can say, "We're getting 95% Ok-ed first assemblies," that means something. ORIGINAL FELLOWS CUTTERS can be depended upon to maintain high accuracy indefinitely. Therein lies true economy. Give us the opportunity to prove this statement—standardize on ORIGINAL FELLOWS GEAR SHAPER CUTTERS.

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Springfield, Vermont, U. S. A.
Detroit Office: 616 Fisher Building

FELLOWS
~ GEAR SHAPER ~
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AMERICAN FELT CO.
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A complete line including gear or hydraulic feed, single or multiple spindle vertical, horizontal and way type.
BAKER BROTHERS, INC. TOLEDO, OHIO

DILECTO
DILECTO insulating sheets, rods, tubes and special shapes.
Also CELORON Timing Gears and Diamond Vulcanized Fibre.
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FOOTBURT
Single and multiple spindle special drilling, boring, reaming, tapping machine and FOOTBURT Sipp Sensitive Drilling Machines
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THE NATIONAL MACHINERY CO. TIFFIN, OHIO
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DETROIT, 2457 Woodward Ave.

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BARS & SHAPES
SKELP
SHEETS
PIPE
SPECIALTIES
ENDURO-REPUBLIC'S PERFECTED STAINLESS STEEL
AGATHON ALLOY STEELS
REPUBLIC STEEL CORP.
YOUNGSTOWN, OHIO

BUYERS' GUIDE

Automotive Products and Factory Equipment Manufactured by Advertisers in This Issue

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Arms & Knuckles, Steering
Atlas Drop Forge Co.

Axles
Atlas Drop Forge Co.
Park Drop Forge Co.

Bearings, Anti-Friction
Ball
New Departure Mfg. Co.

Bending & Straightening Machines
Chambersburg Engineering Co.
Chambersburg National Co.
National Machinery Co.

Blanks
Forged
Atlas Drop Forge Co.

Boring Machines
Baker Bros., Inc.
Foote-Burt Co.

Brake Boosters
Stewart-Warner Corp.

Brake Drums
Motor Wheel Corp.

Brakes
Mechanical
Stewart-Warner Corp.

Bumpers
Stewart-Warner Corp.

Bushings
Fibre
Continental-Diamond Fibre Co.

Camshafts
Atlas Drop Forge Co.

Channels for Glass
Felt
American Felt Co.

Cleaners
Metal
American Chemical Paint Co. (Rust Preventive)

Connecting Rods
Atlas Drop Forge Co.

Crankshafts
Atlas Drop Forge Co.
Park Drop Forge Co.

Cutters
Baker Bros., Inc. (Keyseating)
Fellows Gear Shaper Co. (Gear)

Drilling Machines
Baker Brothers, Inc.
Foote-Burt Co.

Enamels
American Chemical Paint Co. (Rust Proofing)

Felt
American Felt Co.

Fibre Rods, Sheets, Tubes
Continental-Diamond Fibre Co.

Forgings
Atlas Drop Forge Co.
Park Drop Forge Co.

Furnaces, Electric
(*Annealing, Carburizing, Heat Treating, Forging and Welding*)
Electric Furnace Co.

Gaskets
Felt
American Felt Co.

Gear Cutting Machines
Fellows Gear Shaper Co. (Shapers)

Gear Material
Non-Metallic
Continental-Diamond Fibre Co.

Gears
Timing, Non-Metallic
Continental-Diamond Fibre Co.

Grinding Machines
Fellows Gear Shaper Co

Hammers
Power
Chambersburg Engineering Co.
Chambersburg National Co.
National Machinery Co.

Hangers
Shafting
New Departure Mfg. Co.

Heaters, Car
Stewart-Warner Corp.

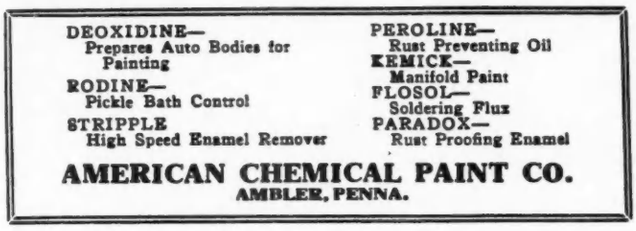
Heat Treating
Barnes Co., Wallace
Barnes-Gibson-Raymond, Inc.
Gibson, Wm. D., Co.

Hose, Flexible Metallic
(*Radiator and Fuel Lines*)
Titeflex Metal Hose Co.

Insulating Material
Continental-Diamond Fibre Co.

Keyseaters
Baker Brothers, Inc.

STAMPINGS
WORCESTER STAMPED METAL
QUALITY STAMPINGS
Heavy, medium and light stampings in any quantity. A steady flow of production—when you want it.
WORCESTER STAMPED METAL CO.
Worcester, Mass.



BUYERS' GUIDE—Continued

Lapping Machines
Fellows Gear Shaper Co.

Lathes
Automatic Chucking
Potter & Johnston Machine Co.
Turret
Potter & Johnston Machine Co.

Molded or Machined Parts (Phenolic)
Continental-Diamond Fibre Co.

Pads
Felt
American Felt Co.

Paints
Heat Resisting
American Chemical Paint Co.

Pickling Compounds
American Chemical Paint Co.

Piston Rings
Sealed Power Corp.

Plugs
Expansion
Hubbard Spring Co., M. D.

Presses
Chambersburg Engineering Co.
Chambersburg National Co.
National Machinery Co.

Removers, Enamel and Paint
American Chemical Paint Co.

Rust Removers & Preventives
American Chemical Paint Co.

Screw Machine Products
Barnes Co., Wallace

Screw Machines
Potter & Johnston Machine Co.

Shafts, Axle, Propeller and Transmission
Pittsburgh Steel Co.

Shafting
New Departure Mfg. Co.

Shock Absorbers
Stewart-Warner Corp.

Special Machinery
Baker Brothers, Inc.

Speedometers and Tachometers
Stewart-Warner Corp.

Springs
Extension, Compression, Torsion or Flat
Barnes Co., Wallace
Barnes-Gibson-Raymond, Inc.
Cook Spring Div.
Gibson, Wm. D., Co.
Hubbard Spring Co., M. D.
Mather Spring Co.
Raymond Mfg. Co.
Leaf
Mather Spring Co.

Stampings or Drawings, Metal
Barnes Co., Wallace
Barnes-Gibson-Raymond, Inc.
Cook Spring Div.
Gibson, Wm. D., Co.
Hubbard Spring Co., M. D.
Motor Wheel Corp.
Raymond Mfg. Co.
Worcester Stamped Metal Co.

Steam Cooling
Rushmore Laboratory

Steel
Alloy
Republic Steel Corp.
Bars
Republic Steel Corp.
Carbon
Republic Steel Corp.
Cold Drawn
Republic Steel Corp.
Spring
Barnes Co., Wallace
Barnes-Gibson-Raymond, Inc.
Gibson, Wm. D., Co.
Stainless
Republic Steel Corp.
Strip
Republic Steel Corp.

Tapping Machines
Baker Bros., Inc.
Foote-Burt Co.

Thread Generators
Fellows Gear Shaper Co.

Tubes, Axle, Steering Column & Torque
Pittsburgh Steel Co.

Tubing
Flexible Metal
Titeflex Metal Hose Co.
Seamless
Pittsburgh Steel Co.
Steel
Pittsburgh Steel Co.

Tubular Products
Pittsburgh Steel Co.

Turret Machines, Automatic
Potter & Johnston Machine Co.

Vacuum Tanks
Stewart-Warner Corp.

Washers
Felt
American Felt Co.
Plain Metal
Hubbard Spring Co., M. D.

Wheels
Motor Wheel Corp.

Wicks, Felt
American Felt Co.

Windshield Wipers
Stewart-Warner Corp.

Wire
Flat, Round, Square or Special Shape
Barnes Co., Wallace
Spring
Barnes Co., Wallace
Pittsburgh Steel Co.
Republic Steel Corp.

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PJ FOR OVER A QUARTER OF A CENTURY PJ

THE PIONEER MANUFACTURER OF AUTOMATIC CHUCKING EQUIPMENT

POTTER & JOHNSTON MACH. CO.

PAWTUCKET, R. I., U. S. A.

EXPANSION PLUGS

FOR CLOSING CORE HOLES

COILED and FLAT SPRINGS

PHOSPHOR BRONZE SPRINGS A SPECIALTY

SMALL STAMPINGS

WASHERS and SPRING COTTERS

WIRE SHAPES

M. D. HUBBARD SPRING CO.

620 SOUTH BLVD. PONTIAC, MICHIGAN

Rx

Send your sales message to the world's richest industrial market through the advertising pages of

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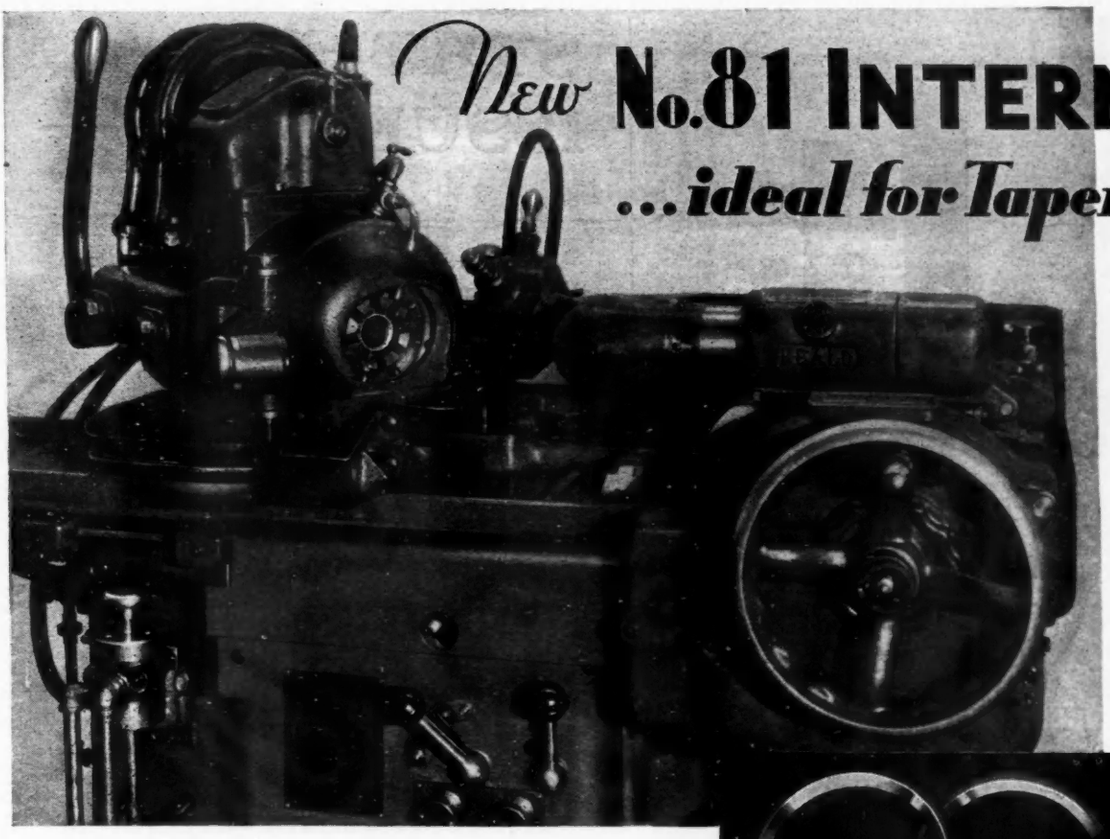
A CHILTON PUBLICATION

Chestnut and 56th Streets
Philadelphia

"AUTOMOTIVE HEADQUARTERS"



New No. 81 INTERNAL ... *ideal for Taper Work*

MEETING with universal approval on all small work with straight holes, the No. 81 Small, Automatic Internal Grinding Machine has been found ideal for taper surfaces.

An example of this work is shown above, where one of several No. 81 Machines is grinding the 45° conical surface of valve seats.

Roundness and concentricity of this surface with the outside diameter must be held to very close limits and yet these parts are being ground at the rate of 150 per hour.

The workheads of these machines carry separate motors, permitting them to be swung to the necessary wide angle. The special diaphragm fixture assures the utmost accuracy of holding, locating from the previously ground O.D. and automatically ejects the work into a chute when the fixture is opened. The loading arm assures accurate location of the parts in the fixture and makes loading rapid and convenient.

• *If you have small hole grinding of any kind, you should have a bulletin on the No. 81 Internal*

The Heald Machine Company, Worcester, Massachusetts, U. S. A.

Branch Offices at Chicago, Cleveland, Detroit and New York

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FELT WASHERS
FELT GASKETS
FELT FLOOR BOARD ANTI-SQUEAK STRIPS
FELT CLUTCH AND BRAKE PEDAL WALKER STRIPS
FELT FRAME TO BODY ANTI-SQUEAK STRIPS
FELT RUBBERIZED WINDSHIELD PACKING
JUTE RUBBER MAT PADDING IN ALL THICKNESSES
HAIR AND JUTE PADDING IN ALL THICKNESSES FOR ACOUSTICAL PURPOSES
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New York — Boston — Cleveland — Detroit — St. Louis — San Francisco — Los Angeles
WESTERN FELTS

STATISTICAL ISSUE of ——

Automotive Industries is published every Saturday by

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ONCE again in this its Fifteenth Annual Statistical Issue, Automotive Industries brings the saga of automobile commercial and technical progress up to date.

Three years of the most severe depression the modern world has known have served only to strengthen the position of the motor vehicle in our social and economic fabric. Compared with the huge shrinkages in business activity and in public purchasing power, the decline in automobile use as reflected by registrations and gasoline consumption has been relatively insignificant.

Production, it is true, has shrunk sharply. But while this shrinkage makes the going tough now, in view of the continued extensive use of motor vehicles, it augers well for the future. Last year the public consumed approximately 24,400,000 car-years of transportation and added in the form of new vehicles only about 8,700,000 car-years, a difference of 15,700,000 car-years—a measure of the depletion in the public's inventory of unused transportation in 1932. Altogether, this inventory is probably 40,000,000 car-years short of what it was at the end of 1929. Facts such as this one foreshadow big years ahead because in the not very distant future there will be no more unused transportation to consume. Then car owners will have to replace or walk—and they aren't going to walk.

Despite the buffets which depression has dealt it, there has been no halt in the evolutionary development of the industry's products. The specification tables herein show that in the refinement and improvement of its merchandise, the industry has continued to march forward. As a result, the greatest values in history are being offered to whet the public's already sharpened appetite.

In conclusion, we want to acknowledge our indebtedness to governmental officials and to the many executives in the industry whose cooperation annually makes this issue possible, and particularly to Marcus Ainsworth of the Automotive Industries staff to whose efforts the statistical compilations and the specification tables which make this issue valuable are mainly due.

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